

SONY®

ANALOG AUDIO ROUTING SWITCHER

BVS-A3232

BACKUP POWER SUPPLY FOR BVS-A3232
BKDS-PA3291

BACKUP CONTROL BOARD
BKDS-RS1690

MAINTENANCE MANUAL

1st Edition

Serial No. 10001 and Higher (BVS-A3232)

Serial No. 10001 and Higher (BKDS-PA3291)

Serial No. 10001 and Higher (BKDS-RS1690)

⚠ 警告

このマニュアルは、サービス専用です。

お客様が、このマニュアルに記載された設置や保守、点検、修理など行くと感電や火災、人身事故につながる可能性があります。

危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

⚠ WARNING

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠ WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegebenen Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠ AVERTISSEMENT

Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

For the customers in the U.S.A.

Attention-when the product is installed in Rack:

1. Prevention against overloading of branch circuit

When this product is installed in a rack and is supplied power from an outlet on the rack, please make sure that the rack does not overload the supply circuit.

2. Providing protective earth

When this product is installed in a rack and is supplied power from an outlet on the rack, please confirm that the outlet is provided with a suitable protective earth connection.

3. Internal air ambient temperature of the rack

When this product is installed in a rack, please make sure that the internal air ambient temperature of the rack is within the specified limit of this product.

4. Prevention against achieving hazardous condition due to uneven mechanical loading

When this product is installed in a rack, please make sure that the rack does not achieve hazardous condition due to uneven mechanical loading.

For the customers in the U.S.A. and Canada

RECYCLING NICKEL-CADMIUM BATTERIES



Ni-Cd

**NICKEL-CADMIUM BATTERY.
MUST BE DISPOSED OF PROPERLY.**

Nickel-Cadmium batteries are recyclable. You can help preserve our environment by returning your unwanted batteries to your nearest Sony Service Center or Factory Service Center for collection, recycling or proper disposal.

Note: In some areas the disposal of nickel-cadmium batteries in household or business trash may be prohibited.

For the Sony Service Center nearest you call 1-800-222-SONY (United States only)

For the Factory Service Center nearest you call 416-499-SONY (Canada only)

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Manual Structure

Purpose of this manual

This manual is the maintenance manual of following models.

Analog Audio Routing Switcher	BVS-A3232
Backup Power Supply for BVS-A3232	BKDS-PA3291
Backup Control Board	BKDS-RS1690

This manual is intended for use by trained system and service engineers, and describes the information for maintenance and detailed service.

Note

The functions and specifications of BKDS-PA3291 and BVS-A3232's power supply unit are equal. Therefore, BKDS-PA3291 and BVS-A3232's power supply unit are described in this manual as "Power Supply Unit".

Contents

This manual is organized by following sections.

Section 1 Installation

This section explains the installation environment, the power specifications, the power cord of recommendation and the installation of the optional board/unit, etc.

Section 2 Service Information

This section explains the location of main parts, the removal of panels, how to replace the parts, the cleaning procedure of the air filter, how to use the extension boards, and ISR (Interactive Status Reporting).

Section 3 Maintenance Mode

This section explains the test mode and error indications.

Section 4 Electrical Alignment

This section explains the adjustment after replacing the power supply unit and part.

Section 5 Spare Parts

This section describes the spare parts.

Section 6 Semiconductor Pin Assignments

This section describes the pin assignments of semiconductors.

Section 7 Block Diagrams

This section describes the block diagrams of overall, CPU-94 board and MX-82 board.

Section 8 Board Layouts and Locations of Components

This section describes the board layouts and locations of components.

Section 9 Schematic Diagrams

This section describes the schematic diagrams of the boards.

Related manuals

The following manuals are prepared for BVS-A3232 and BKDS-PA3291/RS1690.

- **Operation Manual (Supplied with BVS-A3232)**

This manual describes the notes on operating, the locations and functions of parts and controls, and the specifications of BVS-A3232.

- **Installation Manual (Supplied with BVS-A3232)**

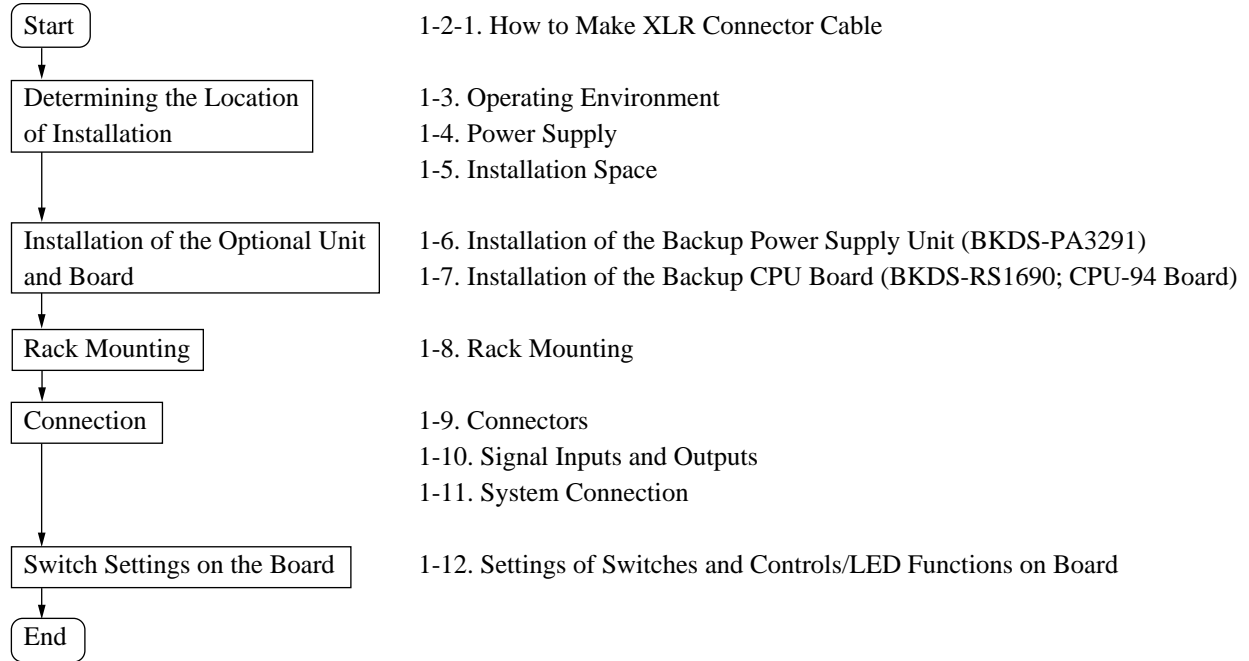
This manual contains the information on setting up the software when installing BVS-A3232.

Section 1

Installation

1-1. Installation Procedure

The installation procedure of BVS-A3232 is shown in the following flowchart.
Refer to each item in this manual for details.



1-2. Supplied Accessories

Connector Cover Set (including cable retainer, sticker, and sticker clear cover)	32 sets
Connector Plug	32 pcs
75 Ω Terminator (BNC Type)	3 pcs
BNC Connector (T Type Bridge)	1 pc
Screws for Connector	2 pcs
Operation Manual	1 pc
Maintenance Manual	1 pc
Installation Manual for Software	1 pc

1-2-1. How to Make XLR Connector Cable

The connector plugs and the connector covers are supplied with the BVS-A3232. When connecting an XLR connector cable to the audio signal input/output connector, it is necessary to make the cable with the supplied plug. Make the XLR connector cable following the procedure described below.

Supplied Accessories

Connector plug (MC 6-pin type)	32 pcs
Connector cover set	32 sets

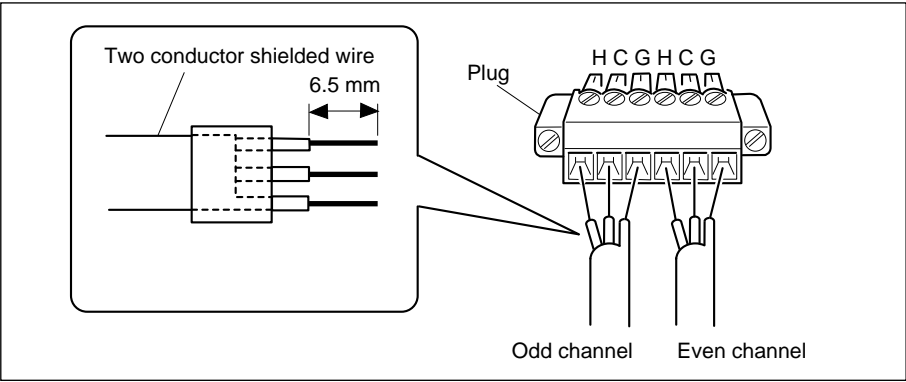
Parts to be Prepared

XLR connector	64 pcs
Two conductor shielded wire	64 pcs

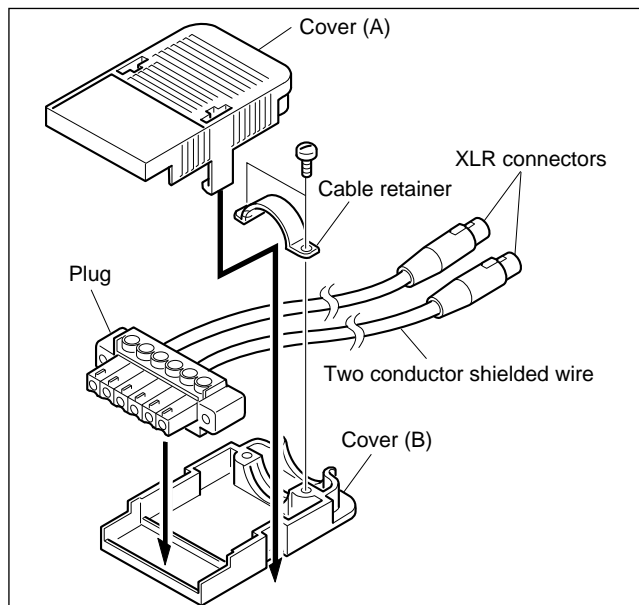
A supplied connector plug requires two XLR connectors and two wires.

Procedure

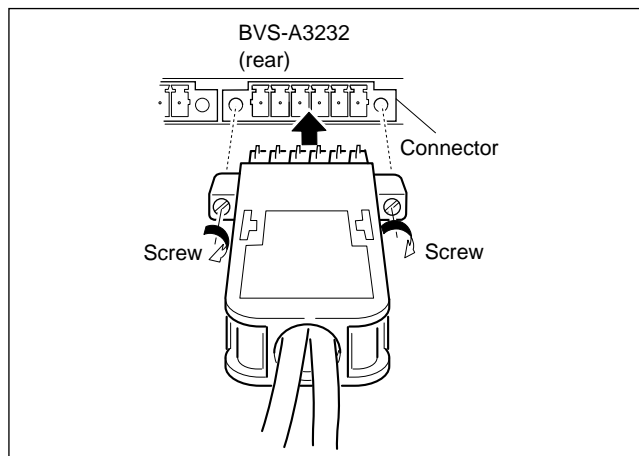
1. Connect an XLR connector to one end of the two conductor shielded wire.
2. Strip off about 6.5 mm of insulation at the other end of the wire.
3. Insert the stripped core wires to the corresponding inlets of the supplied connector plug. Secure the wires using the plug screws. (H: HOT, C: COLD, G: GND)
Tightening torque: 0.29 N•m (0.03 kgf•m)



4. Put the plug connected the cables on the cover (B) and secure the cables with the supplied cable retainer. Then, fit the cover (A) over the plug.



5. Insert the plug to the rear connector of the BVS-A3232 and secure it with the two screws.



1-3. Operating Environment

Operating temperature	+5 °C to +40 °C
Performance temperature	+10 °C to +35 °C
Humidity	20% to 80% (No condensation)
Mass	About 16 kg
(Maximum mass with all optional boards and units installed)	

To prevent overheating of the BVS-A3232 ensure that there is good air circulation around the unit.

BVS-A3232

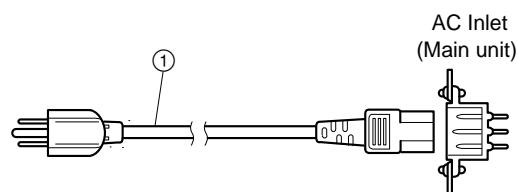
1-4. Power Supply

1-4-1. Power Supply Specifications

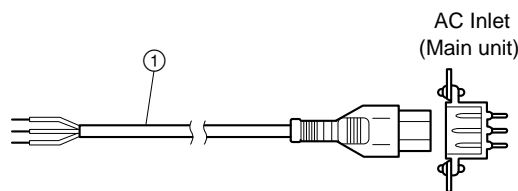
Power voltage	AC 100 V to 240 V $\pm 10\%$
Power frequency	50 or 60 Hz
Power consumption	0.6 A to 1.2 A
(Maximum power consumption with all optional boards and units installed)	
Rush current	15 A (100 V, 25 °C)
	30 A (240 V, 25 °C)

1-4-2. Recommended Power Cord

For customers in the U.S.A. and Canada
 Required Part
 ① Power Cord, 125 V 10 A (2.4 m): DK-2401



For customers in the United Kingdom
 Required Part
 ① Power Cord, 250 V 10 A (2.5 m): 1-590-910-11



Note

For the customers outside of the area as shown above, please consult with local Sony's sales/service office.

WARNING

Use the specified power cord only.
 Be sure to use the recommended power cord to avoid fire and/or an electric shock.

CAUTION

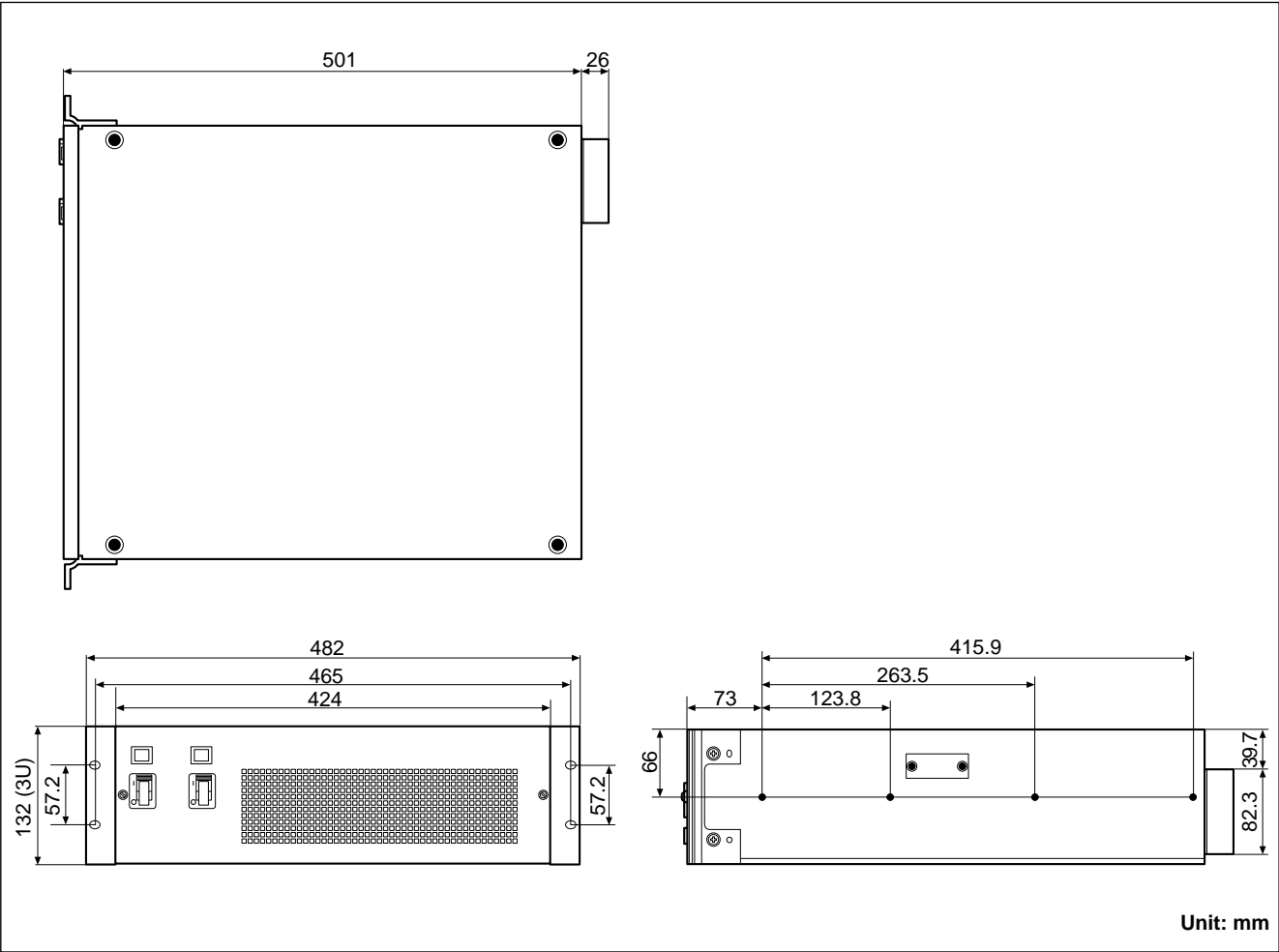
Ground the unit for safety.
 Be sure to attach a ground wire to avoid an electric shock.

1-5. Installation Space

Note

Do not block the ventilation holes of the unit.
Both of the front and rear side must be at least 10 cm away from the walls for ventilation and maintenance.

- The outer dimensions of the BVS-A3232 are as shown in the figure below.



1-6. Installation of the Backup Power Supply Unit (BKDS-PA3291)

Set the power switch of the BKDS-PA3291 to the “O” position before installing it to the BVS-A3232.

Note

The backup power supply unit (BKDS-PA3291) can be installed in the BVS-A3232 while the power switch is set to ON.

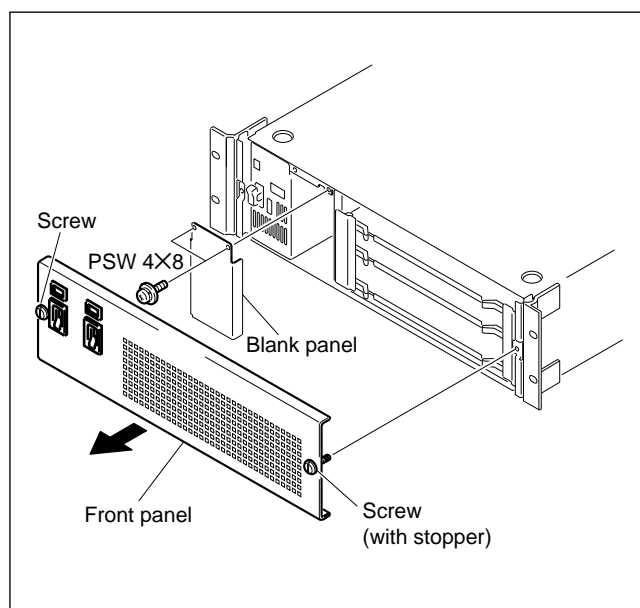
However, the power switch of the BKDS-PA3291 must be set to OFF before installing BKDS-PA3291.

Installation procedure

1. Loosen the two screws (with stopper) and remove the front panel.
2. Remove the two screws and remove the blank panel.
6. Connect the power cord to an AC IN receptacle on the left-hand side (when viewed from the rear side).
7. Turn on the power and make sure that the status indicator lights.

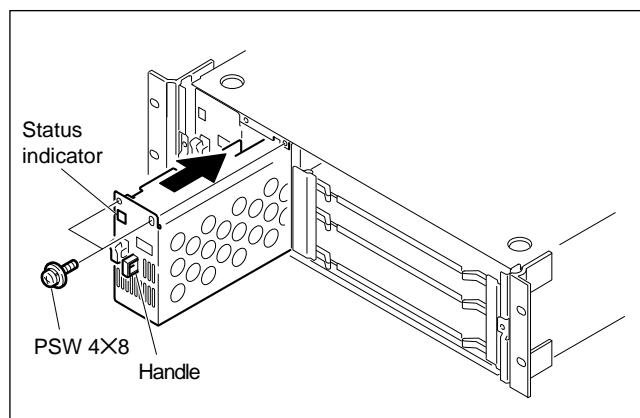
Note

If the status indicator does not light, turn off the power and consult with local Sony's sales/service office.



Removal procedure

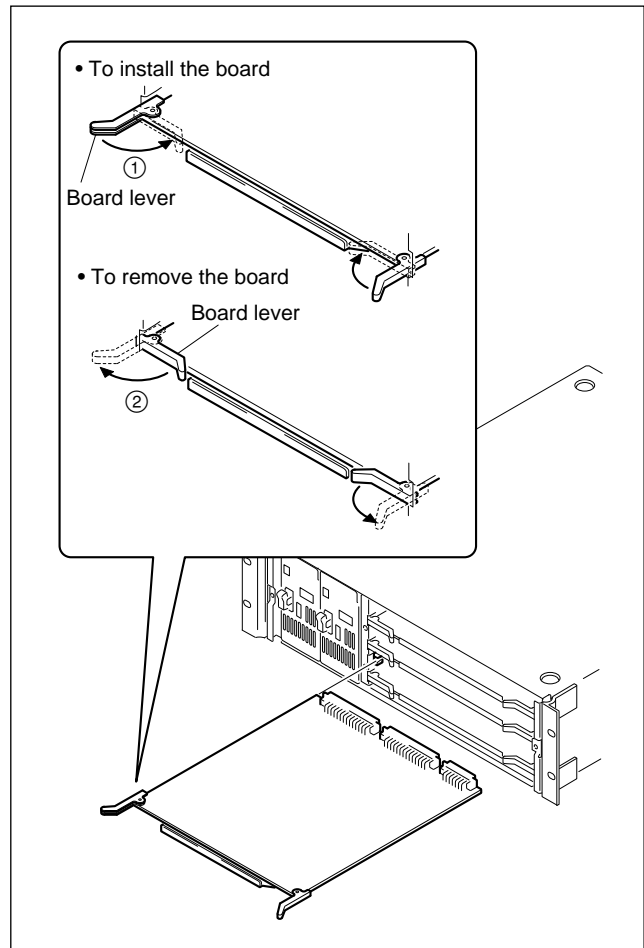
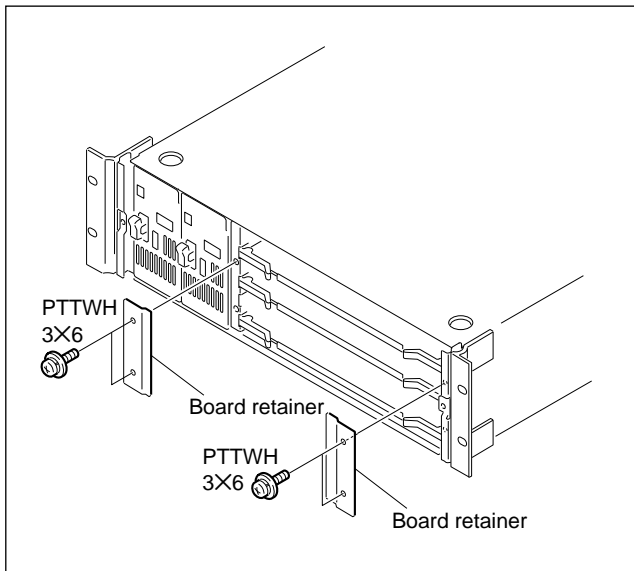
1. Turn off the power of the power supply unit which you want to remove.
2. Remove the two screws on the upper side at front of the BKDS-PA3291.
3. Pull out the BKDS-PA3291 from the slot using its front handle.
4. Secure the blank panel with the two screws removed in step 2.
3. Make sure that the power switch of the BKDS-PA3291 is set to the “O” position.
4. Insert the BKDS-PA3291 into the BVS-A3232 and push it by hand as far as it will go.
5. Secure the BKDS-PA3291 with the two screws removed in step 2.



1-7. Installation of the Backup CPU Board (BKDS-RS1690; CPU-94 Board)

1-7-1. Installation Procedure

1. Turn off the power of the BVS-A3232.
2. Loosen the two screws and remove the front panel.
3. Remove the four screws and remove the board retainer.
4. Insert the board along with the board guide rail into slot 3. Turn the board levers in the direction of the arrows ① after inserting the board to the end of the slot by hand.



5. Install the board retainer with the four screws removed in step 3.
6. Install the front panel.

Note

When removing the board, turn the board levers in the direction of the arrows ②, and remove the board from the slot.

1-7-2. Initial Setting of the Backup CPU-94 Board

Backup CPU-94 board is used in some different models in addition to BVS-A3232.

Therefore, it is necessary to enter the name and code of the installed model into RAM with battery on the backup CPU-94 board when installing.

Equipment required

A personal computer with the terminal software installed.

Installation procedure

1. Turn off the power of the BVS-A3232.
2. Remove the CPU-94 board which has been already installed in slot 4.

Note

Check to see that the software version of the backup CPU-94 board agrees with the version of the removed CPU-94 board.

IC to check: ICG6 (G-6)

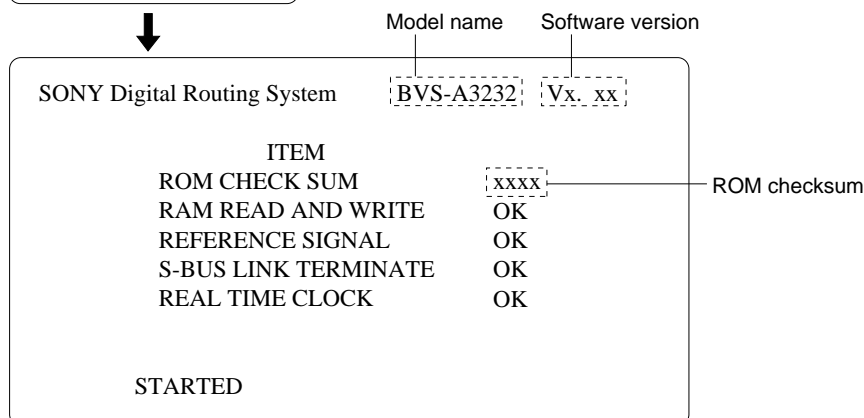
When the software versions are different, consult with local Sony's sales/service office.

3. Connect a personal computer to REMOTE 3 of the BVS-A3232.
4. Set the switch S8-5 on the backup CPU-94 board to ON and insert the board to slot 3.
5. Turn on the power.
6. Enter the model name "BVS-A3232" following "Model:" on the terminal screen and press the enter key.

Model : BVS-A3232 

7. Enter the model code "22" following "Model Code:" on the terminal screen and press the enter key.

Model Code : 22 



8. Turn off the power. Remove the backup CPU-94 board from slot 3.
9. Set the switch S8-5 on the backup CPU-94 board to OFF and return the board to slot 3.
10. Insert the CPU-94 board removed in step 2, into slot 4 and turn on the power.

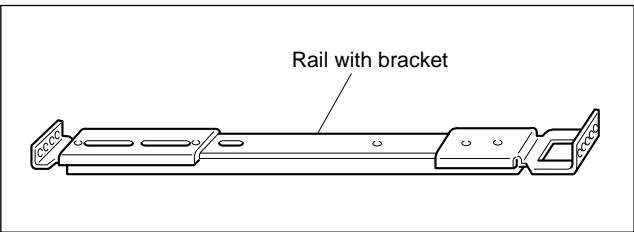
1-8. Rack Mounting

CAUTION

BVS-A3232 can be mounted on an EIA Standard 19-inch rack. Be sure to use the following rail kit.

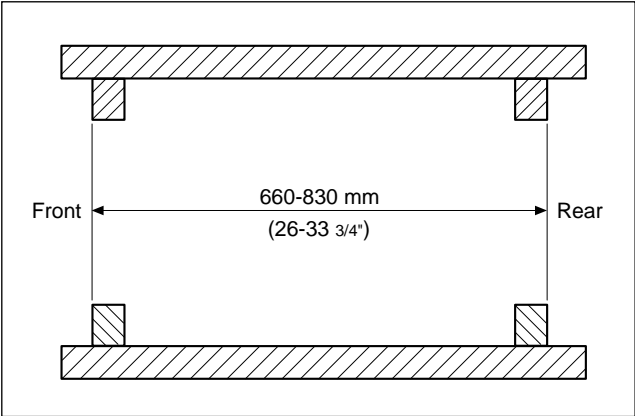
Sony Rack Mount Rail

RMM-30	1 set
• Constituent parts	
Rails with bracket	2 pcs
Screws (+PWH 4× 10)	2 pcs
Plate nut M4	2 pcs
Screw (+B 5× 8)	8 pcs



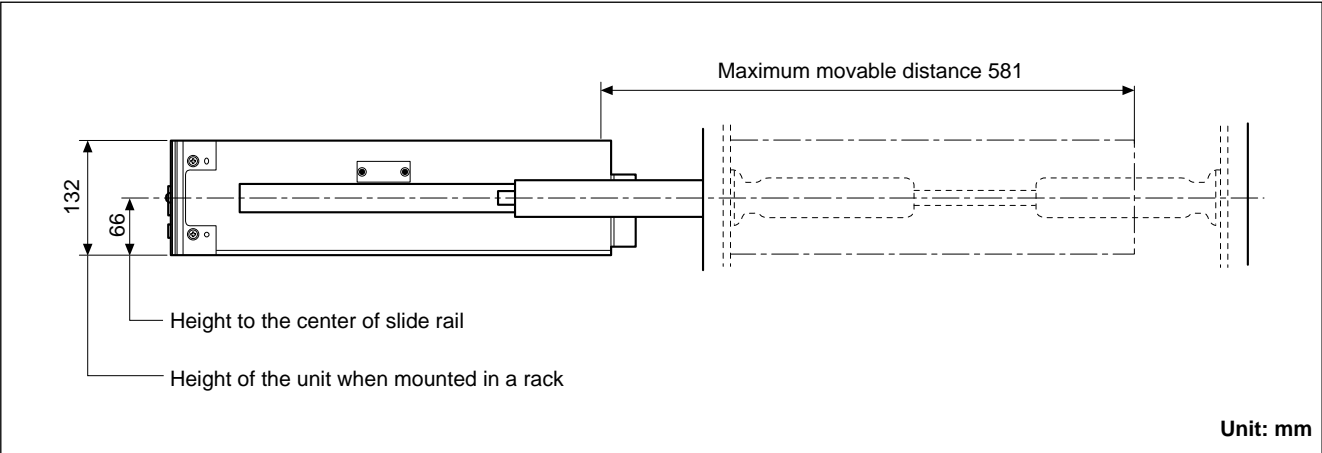
Note

Usable rack is shown below.
Racks having a depth of 660 to 830 mm



Refer to the Installation Manual packed with the rack mounting rail RMM-30 for details on how to install to the rack mounting rail.

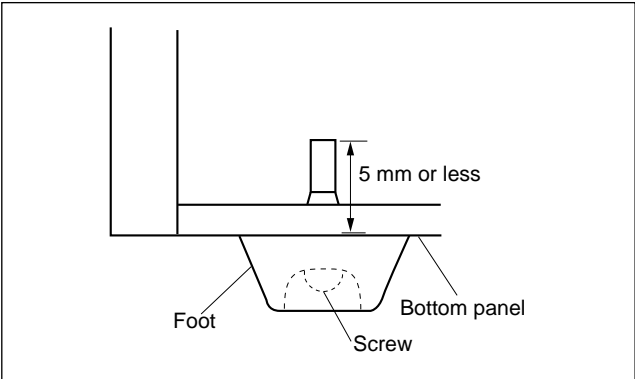
The maximum movable distance of the BVS-A3232 when mounted on a rack is as follows.



Note

BVS-A3232 has the screw holes (M4) for feet mounting in the bottom panel.
If mounting feet with screws, use the screws to satisfy the following specification. If not, the BVS-A3232 may be damaged.

- Screw protrusion : 5 mm or less from the surface of (After mounting foot) bottom panel.



1-9. Connectors

When external cables are connected to the various connectors on the connector panel, the hardware listed below (or the equivalents) must be used.

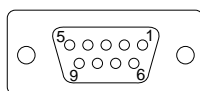
Connector of the BVS-A3232 Side		Matching Connectors or Cables		
Connector Function	Connector Type	Connector Type	Sony Parts Number	
REMOTE	REF IN (× 2)	BNC	BNC 75 Ω	1-564-742-11
	REMOTE 1 (× 3)		BELDEN 8281 cable	
	REMOTE 2	D-sub 9-pin, female	D-sub 9-pin, male	1-509-140-21
			RCC-5G, -10G and -30G (cables) *	
REMOTE 3	D-sub 25-pin, female	D-sub 25-pin, male		1-566-356-11
			RS-232C cable	
INPUT (1 to 32)	MC 6-pin, male	MC 6-pin, female	1-778-702-11	
OUTPUT (1 to 32)				

* These cables are available as optional accessories. The lengths of the cables are 5 m, 10 m and 30 m respectively.

1-10. Signal Inputs and Outputs

The input and output signals of the connectors on the control panel are as follows.

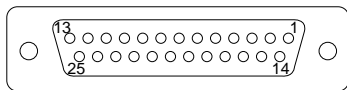
REMOTE 2 (D-sub 9-pin, Female)



<External View>

Pin No.	Signal	Function	Input or Output
1	F.G.	FRAME GROUND	—
2	Tx1 (–)	TRANSMIT A	Output
3	Rx1 (+)	RECEIVE B	Input
4	Rx COM	RECEIVE SIGNAL COMMON	—
5	SPARE	—	—
6	Tx COM	TRANSMIT SIGNAL COMMON	—
7	Tx1 (+)	TRANSMIT B	Output
8	Rx1 (–)	RECEIVE A	Input
9	N.C.	—	—

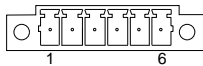
REMOTE 3 (D-sub 25-pin, Female)



<External View>

Pin No.	Signal	Function	Input or Output
1	F.G.	FRAME GROUND	—
2	TXD OUT	TRANSMIT	Output
3	RXD IN	RECEIVE	Input
4	RTS	REQUEST TO SEND	Output
5	CTS	CLEAR TO SEND	Input
6	DSR	DATA SET READY	Input
7	S.G.	SIGNAL GROUND	—
8	—	—	—
9	—	—	—
10	—	—	—
11	—	—	—
12	—	—	—
13	—	—	—
14	—	—	—
15	—	—	—
16	—	—	—
17	—	—	—
18	—	—	—
19	—	—	—
20	ER	DATA TERMINAL READY	Output
21	—	—	—
22	—	—	—
23	—	—	—
24	—	—	—
25	—	—	—

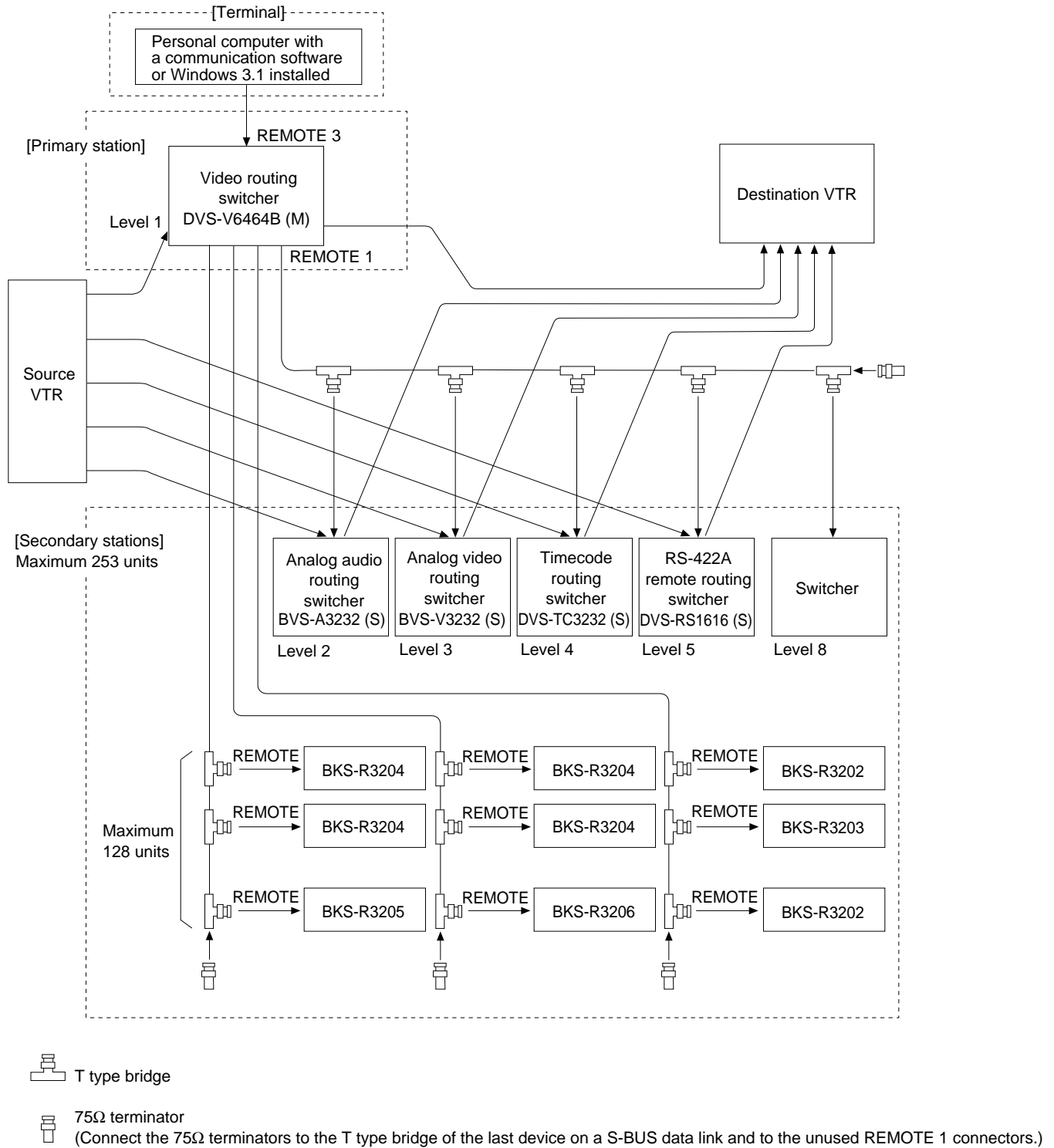
Input/Output (MC 6-pin, male)



<External View>

Pin No.	Signal
1	HOT (ODD CHANNEL)
2	COLD (ODD CHANNEL)
3	GROUND (ODD CHANNEL)
4	HOT (EVEN CHANNEL)
5	COLD (EVEN CHANNEL)
6	GROUND (EVEN CHANNEL)

1-11. System Connection



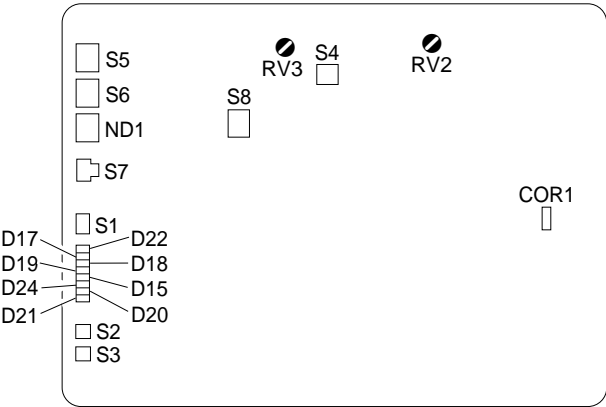
Either one of the REMOTE 1 connectors of the secondary station routing switchers can be used.

1-12. Settings of Switches and Controls/LED Functions on Board

Note

Addresses of components on the board are shown in parentheses following reference number.

1-12-1. CPU-94 Board (BVS-A3232, BKDS-RS1690)



CPU-94 Board (Side A/Component Side)

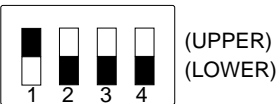
Factory Setting List

SW No.	Set Position	Remarks
S1	S1-1	SYNC
	S1-2	–
	S1-3	M
	S1-4	–
S4	1	
S5	All ON	
S6	All ON	
S7	0	
S8	S8-1 to S8-3	ON
	S8-4 to S8-8	OFF
COR1	ON	

S1 (A-8): (DIP switch)

The factory setting is as follows.

(The ■ mark indicates the switch lever position.)



• S1-1: SW POINT

This switch selects switching, synchronous or asynchronous with the reference video signal.

Upper position (SYNC) : Signal is switched synchronous with the reference video signal. (Factory setting)

Lower position (ASYNC) : Signal is switched asynchronous with the reference video signal.

• S1-2: KILL

All activity is shut down if the switch is set to the upper position (KILL ON).

Be sure to set to the lower position in usual.

Factory setting: Lower position (KILL OFF)

• S1-3: M/S Switch

This switch defines this unit as the primary station or the secondary station on the S-BUS link.

Upper position (S) : Secondary station

Lower position (M) : Primary station (Factory setting)

LED D24 (M/S lamp) lights.

Note

Do not set two or more primary stations on a single S-BUS data link.

• S1-4: NTSC/PAL Mode

This switch selects the timecode format but not used in the BVS-A3232.

Factory setting: Lower position (NTSC)

S2 (A-11): RESET (Tactile switch)

This is the hardware reset switch of the CPU-94 board.

Press the RESET switch of the CPU board on which the indicator D15 (ACTIVE) lights in order to change the operation from the main CPU-94 board to the backup CPU-94 board.

S3 (A-12): NMI (Tactile switch)

This is a test switch. Press this switch to enter the monitor mode. The normal operation is interrupted.

Press the switch S2 (RESET) to return to normal operation.

S4 (G-2): SW LINE SELECT (Rotary switch HEX)

This switch sets the switching position of the crosspoint.

For the details, refer to “Switching Point Depending upon S4 Setting” on next page.

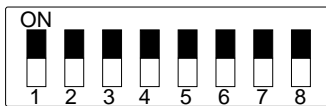
Factory setting: 1

S5 (A-1): STATION ADR (DIP switch)

This switch sets the station address of this unit on the S-BUS link.

The factory setting is shown as follows. (The ■ mark indicates the switch lever position.)

Factory setting: All ON

**S6 (A-2): Not used** (DIP switch)

Factory setting: All ON

S7 (A-5): TEST (Rotary switch HEX)

This switch is used to change a mode of the test.

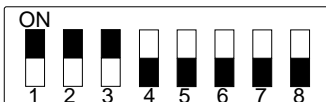
Set the switch to 0 usually.

Refer to “3. Maintenance Mode” for the details.

Factory setting: 0

S8 (D-3): (DIP switch)

This switch selects the modes. The factory setting is shown as follows. (The ■ mark indicates the switch lever position.)



- **S8-1 to 4 : Not used**

- **S8-5 : Model name setting**

When a backup CPU-94 board is installed, it is necessary to input “BVS-A3232” as a supported model into the board.

Set the switch to ON to enter the mode to input the model name. Set the switch to OFF for normal operation.

Refer to “1-7-2. Initial Setting of Backup CPU-94 Board” for the details.

Factory setting : OFF

- **S8-6 and 7 : Not used**

- **S8-8 : ISR mode**

This switch selects ISR mode (ON) or a terminal mode (OFF).

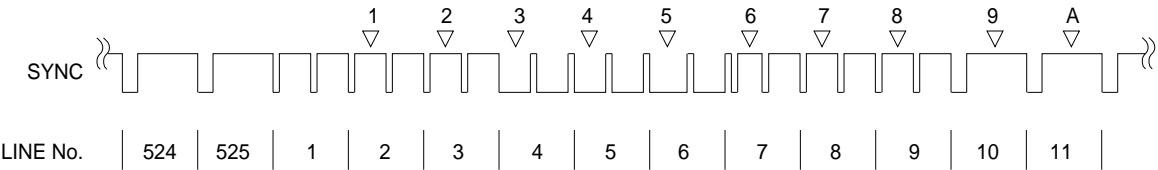
Refer to Section 2-12 for the details of ISR mode.

Factory setting : OFF

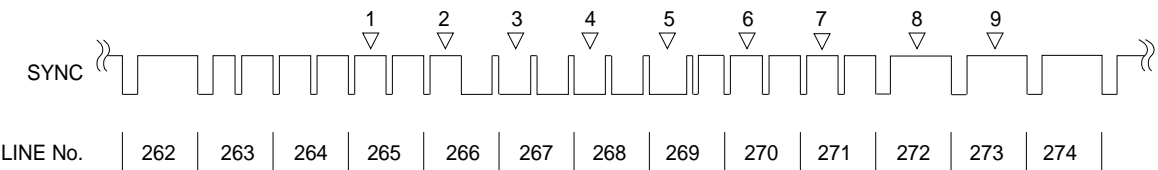
Switching Point Depending upon S4 (SW LINE SELECT) Setting

- 525 LINE switching point

ODD FIELD (Setting of S4)

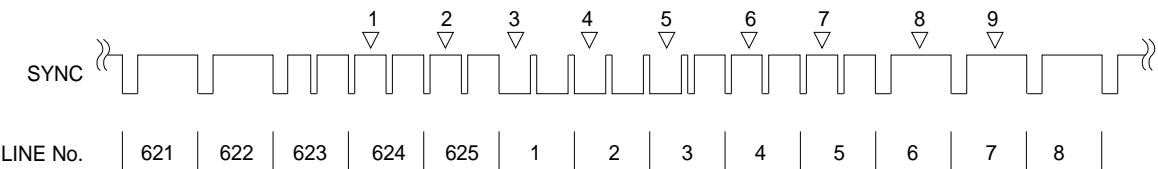


EVEN FIELD (Setting of S4)

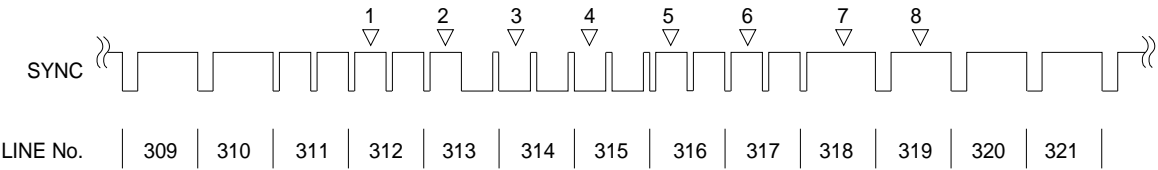


- 625 LINE switching point

ODD FIELD (Setting of S4)



EVEN FIELD (Setting of S4)



Note

Selection of switching point is disabled if S4 is set to any position other than the above positions.

CPU Indicator Function

Ref No.	Name	LED	Function
D15 (A-10)	ACTIVE	green	Lights when the communication BUS line with an external device is open.
D17 (A-10)	S-BUS Rx	green	Lights when the CPU receives a signal from the S-BUS link.
D18 (A-10)	422 Tx	green	Lights when the CPU outputs a signal to the RS-422 (9-pin remote) line.
D19 (A-10)	422 Rx	green	Lights when the CPU receives a signal from the RS-422 (9-pin remote) line.
D20 (A-10)	RUN	green	Lights when the CPU operates normally.
D21 (A-11)	ERR	red	Lights when an error is detected during routine self-diagnosis.
D22 (A-11)	S-BUS Tx	green	Lights when the CPU outputs a signal to the S-BUS link.
D24 (A-11)	M/S	green	Lights when the CPU is set as a primary station on the S-BUS link.

COR1 (N-8): REMOTE 2 (RS-422A) TERMINATE

Set to ON position to control the BVS-A3232 via 9-pin remote.

When connecting multiple BVS-A3232s in the multidrop configuration (connecting multiple BVS-A3232s in a daisy chain connection using loop-through and control them via 9-pin remote), set only COR1 of the last device on the daisy chain to ON. Set COR1 of the other devices to OFF.

ND1 (A-4): ERROR NO

This is 7-segment 2-digit indicator and indicates the simplified error code as a result of self-diagnostics. Refer to “3-5. Error Indications” for the details of the error codes.

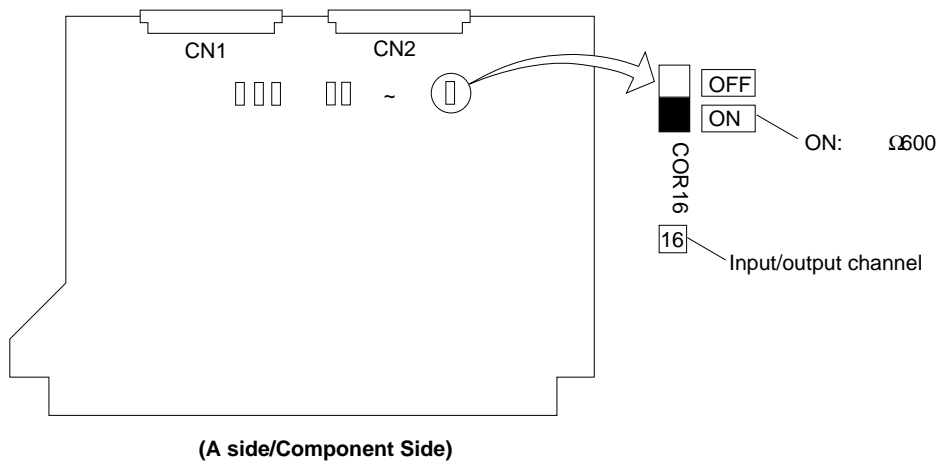
RV2 (L-1): Crosspoint phase adjustment control

Refer to Section 4-2-1 for adjustment procedure.

RV3 (F-2): Buzzer volume adjustment control

Refer to Section 4-2-2 for adjustment procedure.

1-12-2. HN-237 Board



COR1 to COR16: Input impedance selection (Input/Output 1 to 16)

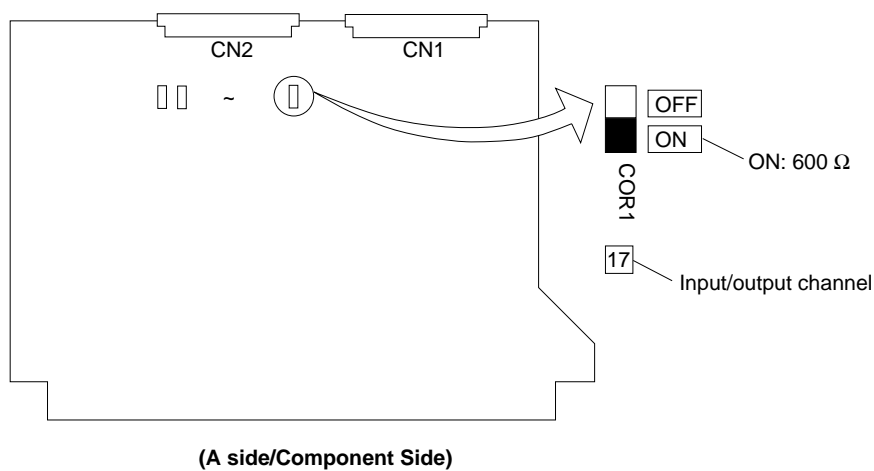
They select the termination resistance. The number printed on the board represents the input and output channel.

ON : 600 Ω

OFF: 10 k Ω

Factory setting: All ON

1-12-3. HN-238 Board



COR1 to COR16: Input impedance selection (Input/Output 17 to 32)

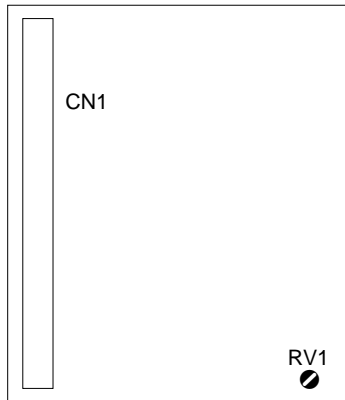
They select the termination resistance. The number printed on the board represents the input and output channel.

ON : 600 Ω

OFF: 10 k Ω

Factory setting: All ON

1-12-4. OPM-24 Board



(A side/Component Side)

RV1: Audio level adjustment control

Refer to section 4-3-2 for adjustment procedure.

1-13. Optional Accessories

- S-BUS Remote Control Panel
 - BKS-R1601 (16-SOURCE CONTROL UNIT)
 - BKS-R3202 (X-Y CONTROL UNIT)
 - BKS-R3203 (32-SOURCE CONTROL UNIT)
 - BKS-R3204 (UNIVERSAL CONTROL UNIT)
 - BKS-R3205 (SOURCE AND DESTINATION CONTROL UNIT)
 - BKS-R3206 (X-Y CONTROL UNIT)
 - BKS-R3280 (SINGLE STATUS DISPLAY UNIT)
 - BKS-R3281 (SINGLE STATUS DISPLAY UNIT)
- 9-pin Remote Cable
 - RCC-5G (5m)
 - RCC-10G (10m)
 - RCC-30G (30m)
- Extension Board
 - EX-351 Board J-6185-310-A
 - <BVS-A3232>
 - For CPU-94 and MX-82 Boards
 - <BKDS-RS1690>
 - For CPU-94 Board
- Recommended Coaxial Cable
 - 75 Ω BELDEN 8281
- Rack Mounting Rail
 - RMM-30

Section 2

Service Overview

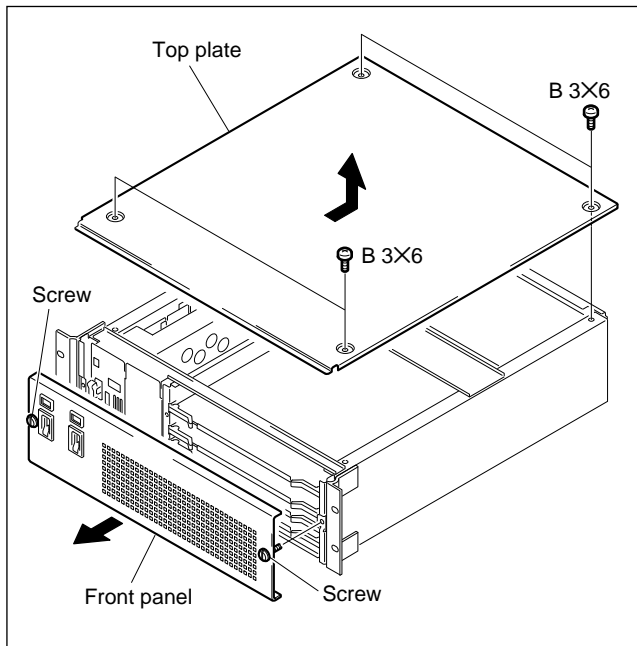
2-1. Removal of Cabinet

Top Plate Removal

Remove the four screws.

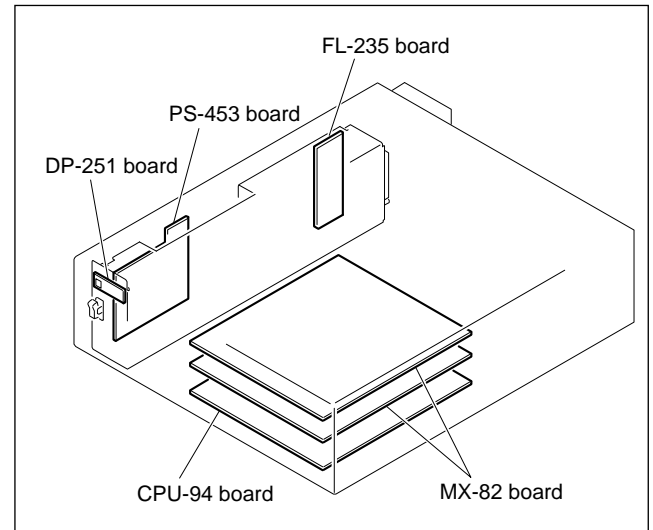
Front Panel Removal

Loosen the two screws.

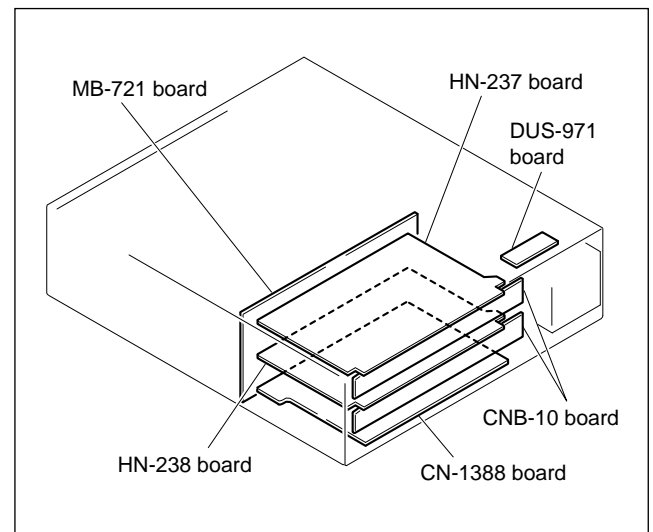


2-2. Main Parts Locations

<Front Side>



<Rear Side>



2-3. Printed Circuit Board Function

2-3-1. BVS-A3232

Block	Board	Function
Front Side	CPU-94	CONTROL BOARD
	MX-82	MATRIX BOARD
	IPM-80	INPUT BOARD
	OPM-24	OUTPUT BOARD
Rear Side	CNB-10	CONNECTOR BOARD
	HN-237	CONNECTOR BOARD
	HN-238	CONNECTOR BOARD
	CN-1388	CONNECTOR BOARD
	MB-721	MOTHERBOARD
Power Supply Unit	DP-251	LED BOARD
	FL-235	FILTER BOARD
	PS-453	POWER SUPPLY BOARD

2-3-2. BKDS-PA3291 (Option)

Block	Board	Function
Power Supply Unit	DP-251	LED BOARD
	FL-235	FILTER BOARD
	PS-453	POWER SUPPLY BOARD

2-3-3. BKDS-RS1690 (Option)

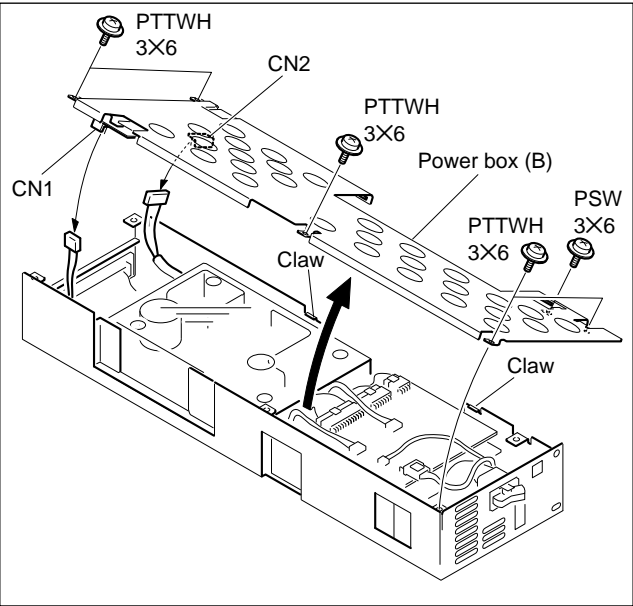
Block	Board	Function
Front Side	CPU-94	CONTROL BOARD

2-4. Switching Regulator Replacement

Adjust power voltage after the switching regulator replacement. (Refer to Section 4-1.)

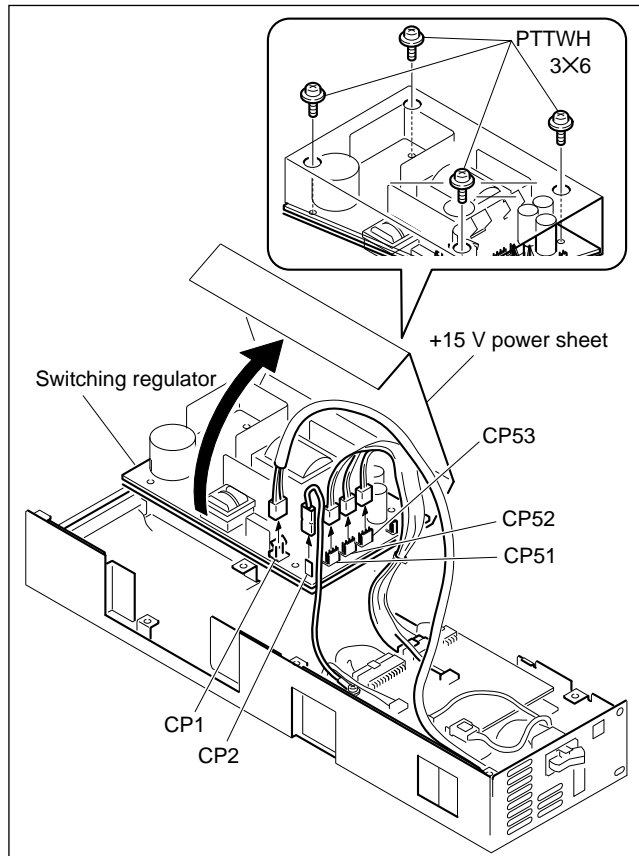
Replacement

1. Remove the front panel. (Refer to “2-1. Removal of Cabinet”)
2. Remove the two screws and pull out the power supply unit from the power slot.
3. Remove the six screws on the power box (B) and disconnect two connectors (CN1, CN2) , then remove the power box (B).

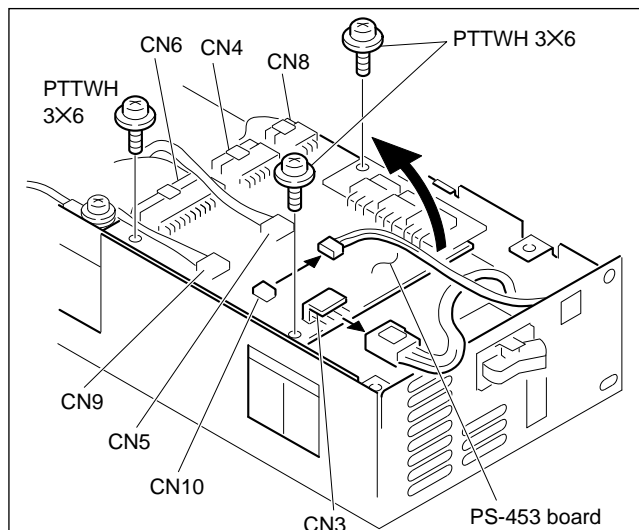


MRW-161

4. Remove the four screws, then remove the switching regulator and the +15 V power sheet.
5. Remove the five connectors (CP1, CP2, CP51, CP52, CP53) on the switching regulator.
6. Replace and attach the switching regulator in the reverse order of steps 1 to 5.

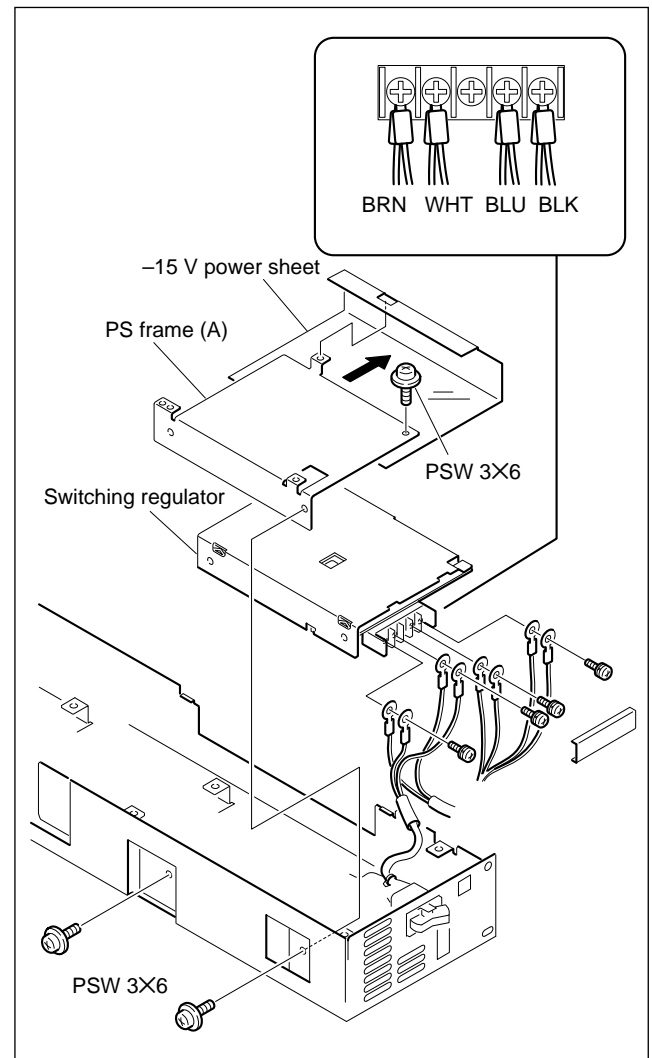
**FAW15-1R7**

4. Remove the three screws and disconnect the two connectors (CN3, CN10) on the PS-453 board.

**Note**

To remove the PS-453 board, also remove the five connectors (CN4, CN5, CN6, CN8, CN9).

5. Remove the three screws, then remove the PS frame (A) and the -15 V power sheet.
6. Remove the four screws and disengage the eight harnesses.
7. Replace and attach the switching regulator in the reverse order steps 1 to 6.



2-5. Backup Battery Replacement

RAM backup battery (BT1) is mounted on the CPU-94 board. Replace the battery with the following as shown in the part list.

Backup battery : Nickel-cadmium battery			
Specifications	Model	GB50H	
	Voltage	3.6 V	
	Capacity	50 mAh	

Sony Part No. : 1-528-202-11

Notes

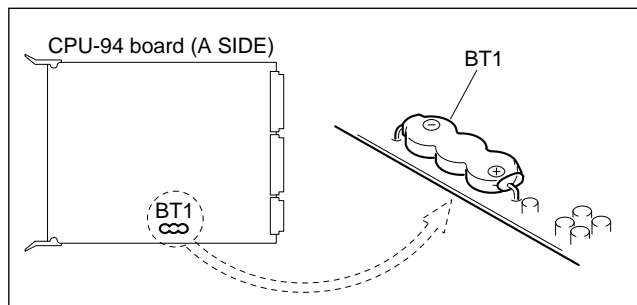
- The battery is guaranteed for the life of three years under normal condition of usage. Replace the battery within three years. If the battery runs down, turning off the power stops the function of internal clock.
- When the optional BKDS-RS1690 is not mounted, battery replacement deletes the crosspoint data.
(For details on data setting, refer to the supplied Installation Manual for software.)

Replacement

1. Turn off the power.
2. Pull out the CPU-94 board.
3. Replace the battery (BT1) on the CPU-94 board.

Notes

- Set the polarity (+) of the battery to the polarity (+) of the board at soldering.
 - Nickel-Cadmium batteries are recyclable.
You can help preserve our environment by returning your unwanted batteries to your nearest Sony Service Center or Factory Service Center for collection, recycling or proper disposal.
- Note : In some areas, the disposal of nickel-cadmium batteries in household or business trash may be prohibit.



4. After Battery Replacement
 - When the optional BKDS-RS1690 is mounted, execute "G: UPDATE BACKUP CONTROLLER" from the primary station control terminal.
 - When the optional BKDS-RS1690 is not mounted, execute "T: SET CLOCK" from the primary station control terminal.
 (For more details, refer to "5-1. Setting Items of the Primary Station" in the Installation Manual.)

2-4(E)

2-6. DC Fan Motor Replacement

WARNING

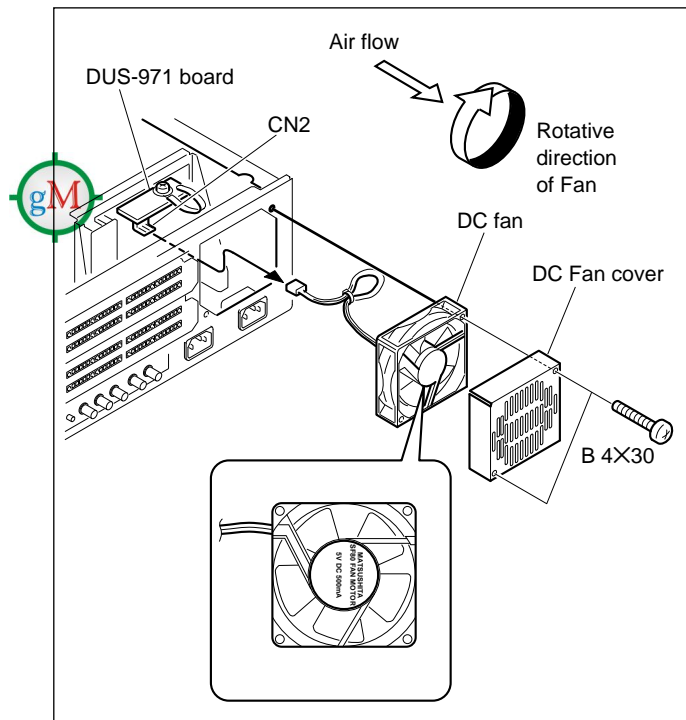
For your safety, turn off the power and unplug the power plug from the outlet before starting the replacement.

Replacement

1. Remove the top plate. (Refer to "2-1. Removal of Cabinet".)
2. Remove the two screws, then take out the DC fan cover.
3. Disconnect the connector (CN2) on the DUS-971 board.
4. Replace and attach the DC fan in the reverse order of steps 1 to 3.

Notes

- Install the DC fan in position the air blowing to rear.
- Hold the cable by the harness clumper to keep the cable away from the DC fan.



2-7. Connector Panel Replacement

WARNING

For your safety, turn off the power and unplug the power plug from the outlet before starting the replacement.

Notes

- Remove the connector panels from the upper slot to the lower slot.
Attach the removed connector panels from the lower slot to the upper slot.
- To remove the connector board, move the right and left ends of the connector panel front and back alternately until the connection with the motherboard is sufficiently loose, then pull out the connector board gently.

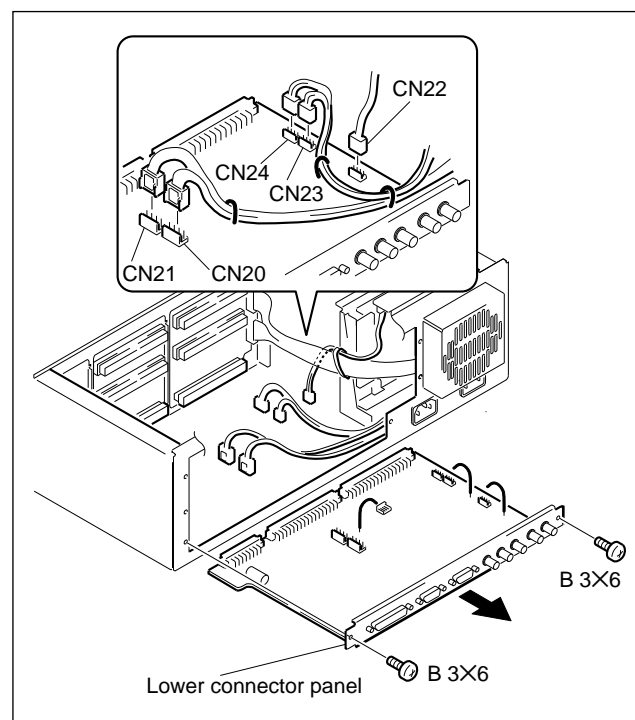
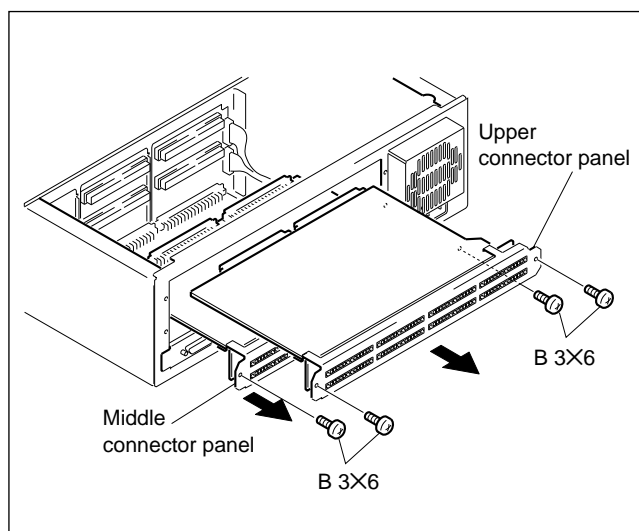
Replacement

- Remove the top plate. (Refer to “2-1. Removed of Cabinet”.)
- Remove the two screws, then pull out the upper connector panel.
- Remove the two screws, then pull out the middle connector panel.
- Remove the two screws and the five connectors (CN20, CN21, CN22, CN23, CN24), then pull out the lower CPU connector panel.

Note

To detach the CPU connector panel from the CN-1388 board, remove the five BNC connectors and the six D-sub connector bolts on the panel.

- Replace and attach the connector panel in the reverse order of steps 1 to 4.



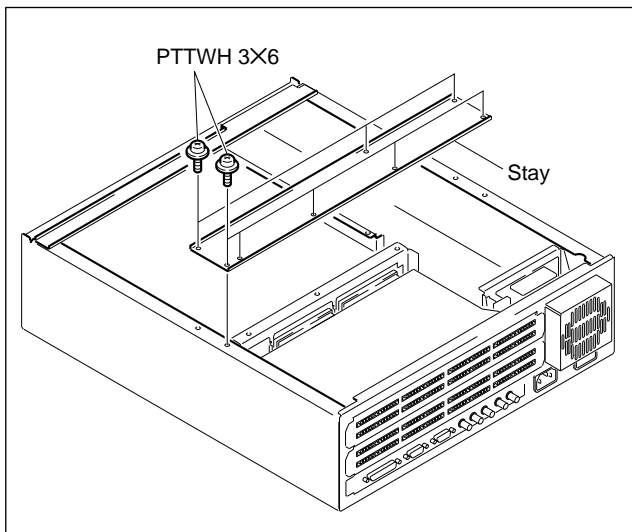
2-8. MB-721 Board Replacement

WARNING

For your safety, turn off the power and unplug the power plug from the outlet before starting the replacement.

Replacement

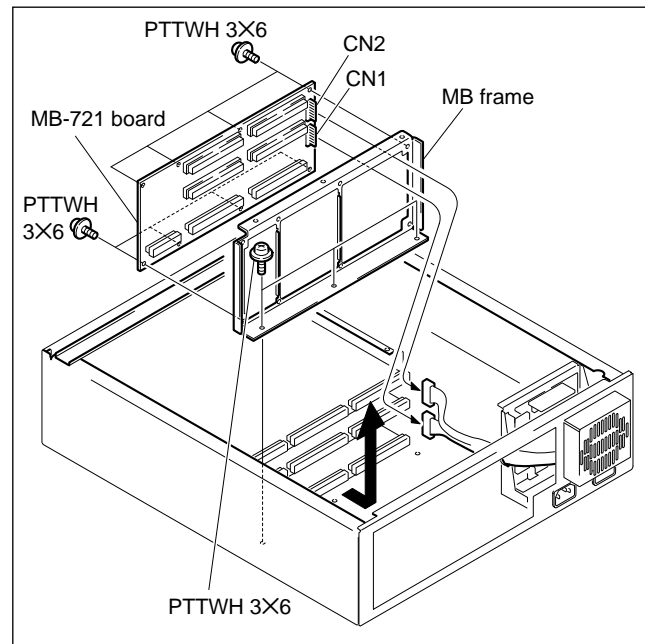
1. Remove the top plate. (Refer to “2-1. Removal of Cabinet”.)
2. Remove the eight screws, then take out the stay.
3. Remove the connector panels from the upper slot to the lower slot. (Refer to Section 2-7.)



4. Remove the three screws fixing the MB frame.
5. Remove the eight screws and the two connectors (CN1, CN2) on the MB-721 board.
6. Replace and attach the MB-721 board in the reverse order of steps 1 to 5.

Note

Attach the connector panels from the lower slot to the upper slot.



2-9. Cleaning

The temperature in the unit increases when dust attaches to the filter and when the air flow is disturbed. This will badly influence the performance and life of the unit. Be sure to clean the filter with attached to the front panel when the filter is clogged with dust.

Note

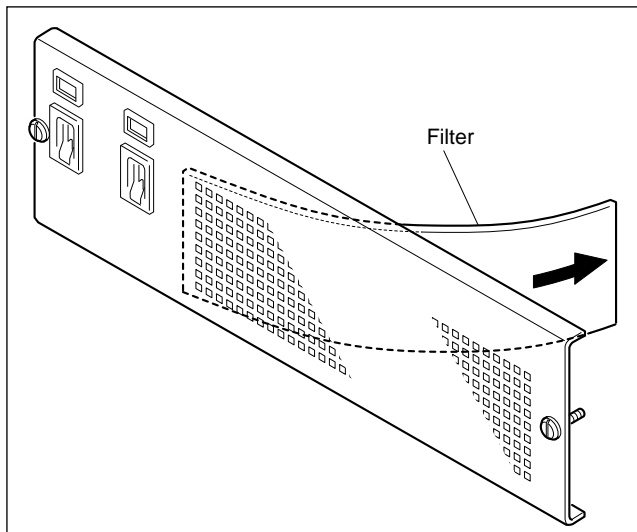
- Turn off the power before cleaning the filter.
- Be sure to remove the air filter from the front panel before cleaning.

Tools

Vacuum cleaner

Cleaning

1. Remove the front panel. (Refer to “2-1. Removal of Cabinet”.)
2. Remove the filter from the front panel.



3. Remove the dust on the filter using a vacuum cleaner.
4. Attach the filter in the reverse order of steps 1 to 2.

2-10. Use of Extension Board EX-351

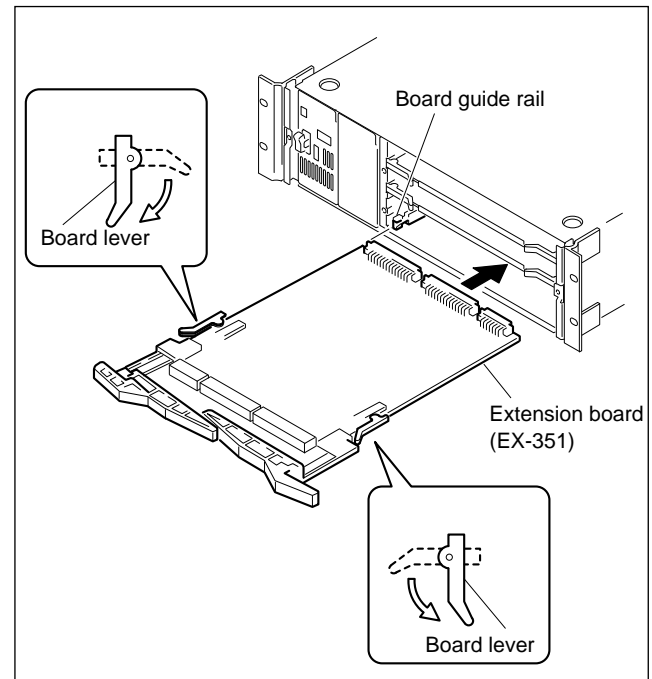
Extension Board EX-351 : Part No. J-6185-310-A

Extension board EX-351 is applicable for the following plug-in boards to be inspected.

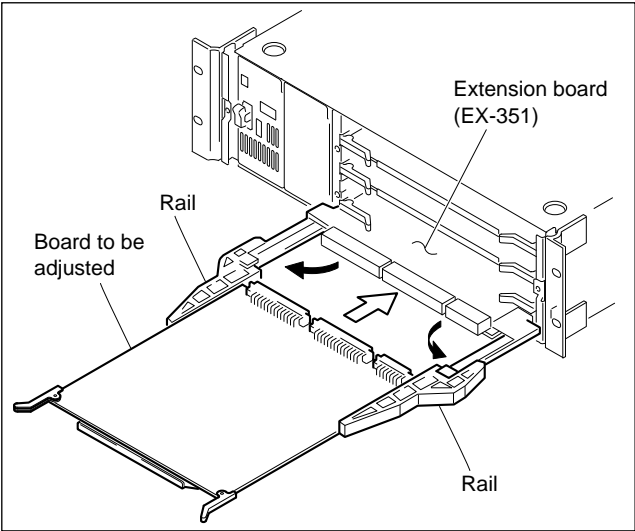
Model Name	Card Board
BVS-A3232	CPU-94
	MX-82
BKDS-RS1690	CPU-94

Procedure

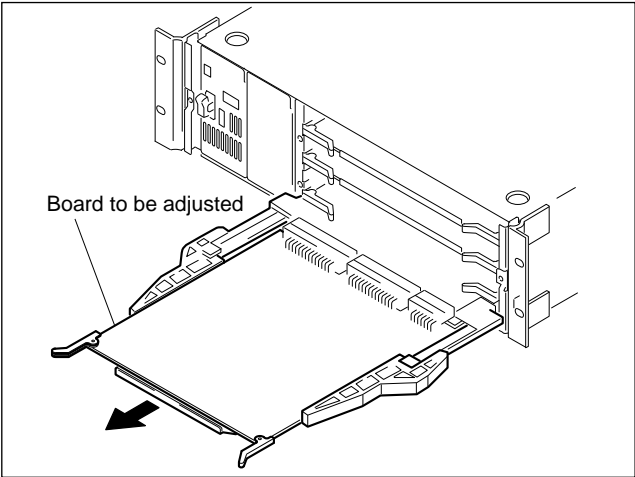
1. Remove the plug-in board in the procedure as shown in Section 1-7 “Optional Board Installation”.
2. Move the board lever in the direction of the arrow and insert completely the extension board along the board guide rail.



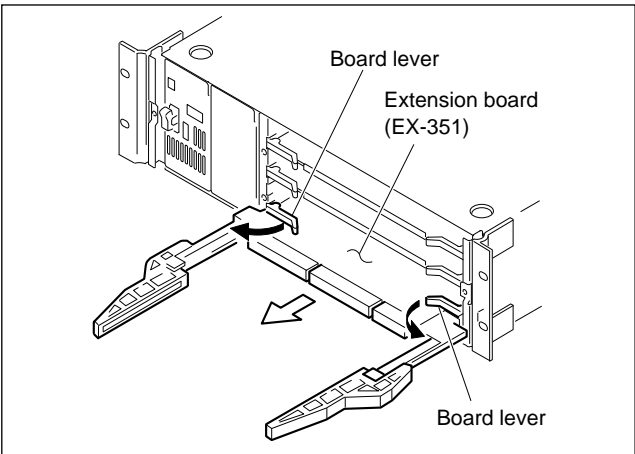
3. Open the rail of the extension board. Insert the adjustment board along the rail and conduct the adjustment.



4. After the adjustment is completed, pull the adjustment board out.



5. Move the board lever in the direction of the arrow and pull the extension board out.



2-11. Notes on Repair Parts

WARNING

Use the specified parts only

Component marked \triangle are critical to safe operation. Therefore, specified parts in the section of Spare Parts should be used in the case of replacement.

1. Safety Related Components Warning

Components marked \triangle are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.

Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with “o” at SP(Supply Code) column of the spare parts list may be not stocked. Therefore, the delivery date will be delayed.

4. Units Representation

The following represented dunits are changed or omitted in writing.

Units		Representation
Capacitance	μF	μF
Inductance	μH	μH
Resistance	Ω	Abbreviation
Temperature	$^{\circ}\text{C}$	XXX-DEG-C

2-12. ISR (Interactive Status Reporting) System

The interactive status reporting (ISR) system is a Sony application program that was developed to monitor and manage intensively the operating status of the equipment used in a broadcasting station and production and the contents of errors occurring in its equipment on the monitor screen of one computer. The BVS-A3232 can be used in this ISR system.

This section describes the information required when the BVS-A3232 are connected to the ISR system. For more details of the ISR system, refer to the manual supplied for the application program and the optional ISR protocol manual.

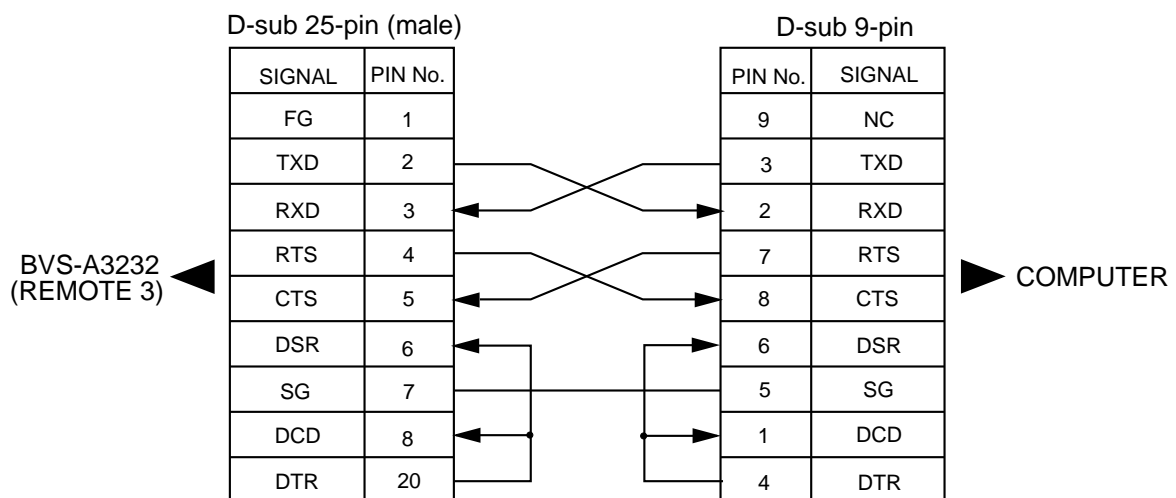
2-12-1. Connection of Equipment

Connector : REMOTE 3 (D-sub 25-pin)

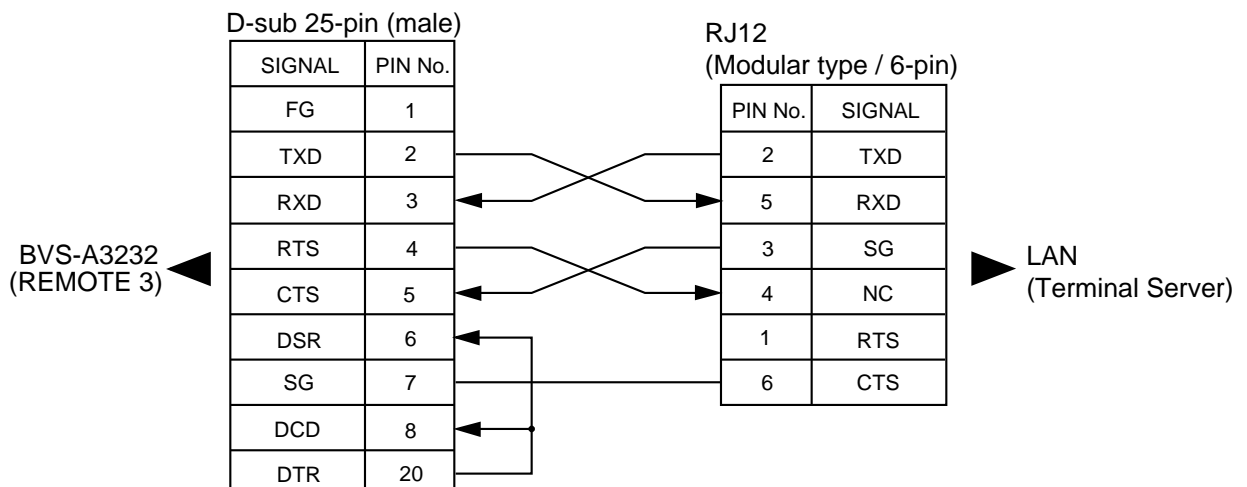
Protocol : ISR protocol. Conforms to the RS-232C signal standard.

Pin assignment of cable:

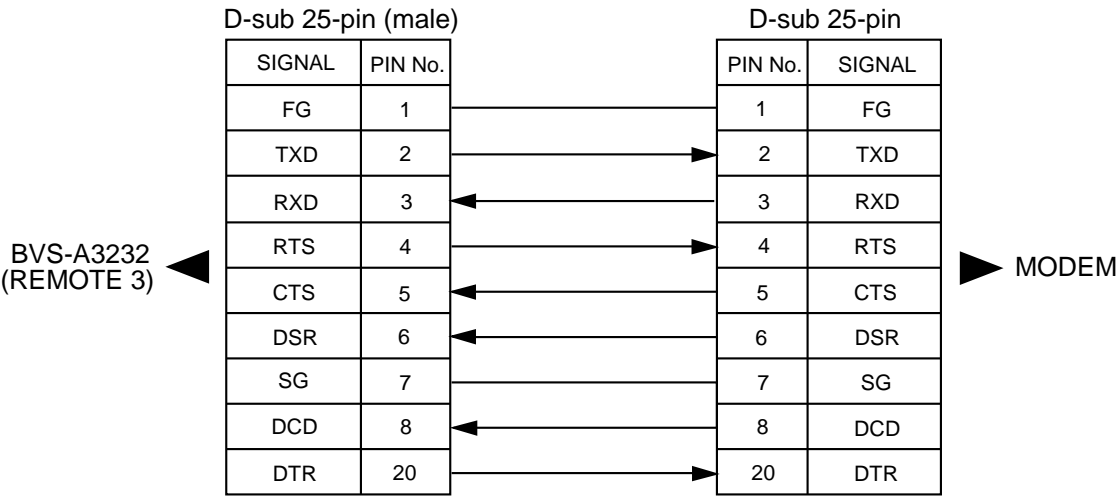
- When directly connected with a computer



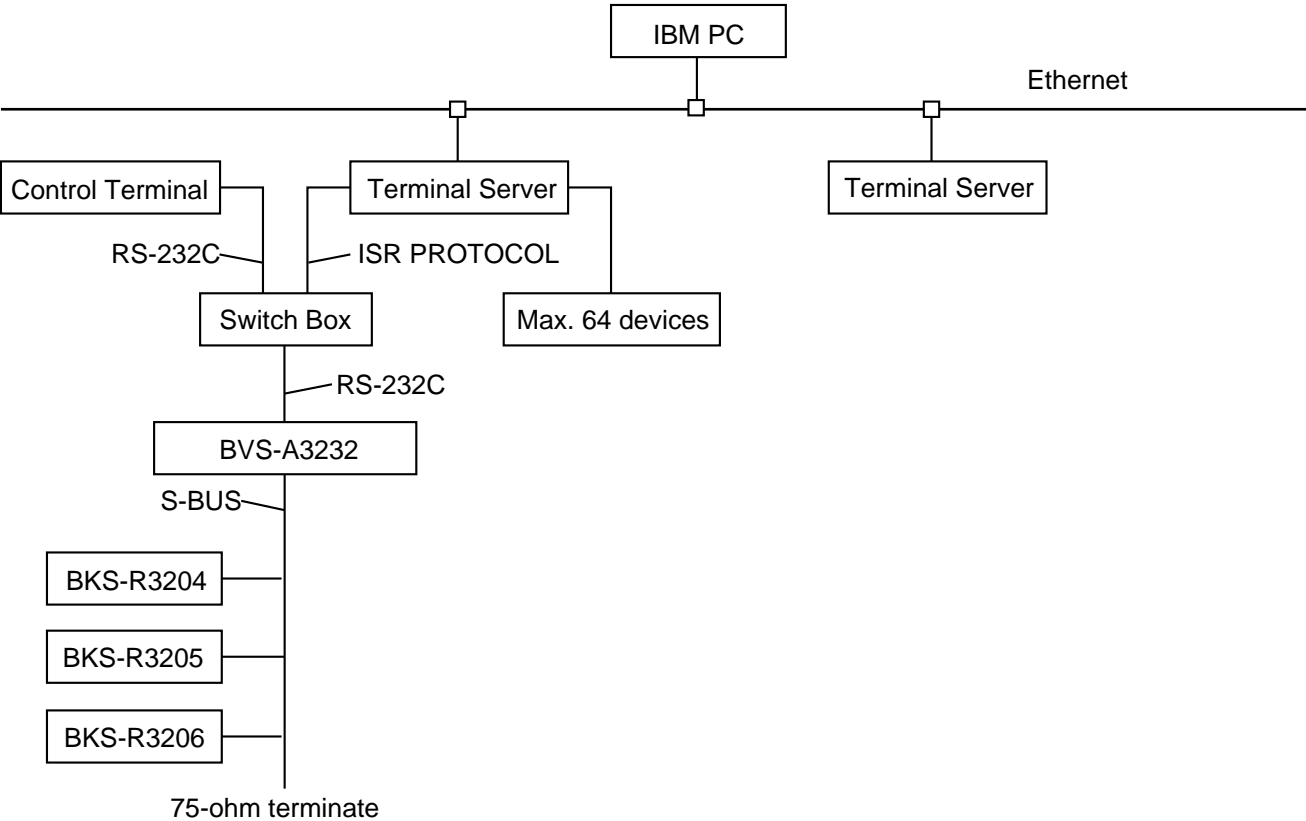
- When connected with a computer via a LAN (terminal server: six-pin port)



- When connected with a computer via a modem



Connection example:



2-12-2. Mode Selection of REMOTE 3 Connector

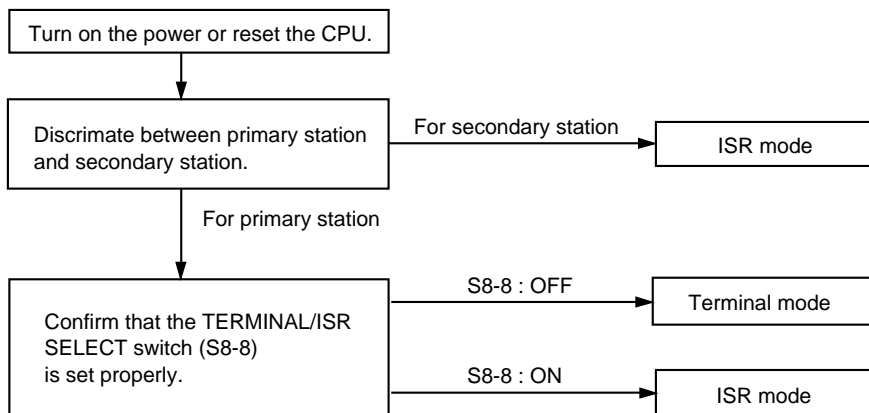
The REMOTE 3 connector has the following two modes. These modes are set using the TERMINAL/ISR SELECT switch (S8-8) on the CPU-94 board.

- Terminal mode
Can be used for only the switcher that is set in the primary station of an S-BUS control system.
Connects the control terminal, and sets and monitors the equipment that constitutes an S-BUS data link.
- ISR mode
Exchanges data via a ISR protocol and uploads necessary data as the ISR system.

The switch setting after each mode has been selected is as shown below. Since the electric characteristics vary depending on the mode, it is necessary to set the electric characteristics according to the selected mode.

Item		Terminal mode	ISR mode
TERMINAL/ISR SELECT switch	S8-8	OFF	ON
Electric characteristics	Speed	9600 bps	9600 bps
	Start bit	1	1
	Data bit	8	7
	Parity bit	non	odd
	Stop bit	1	1

When the power is turned on or the CPU is reset, each mode is selected in the following procedure according to the switch setting.

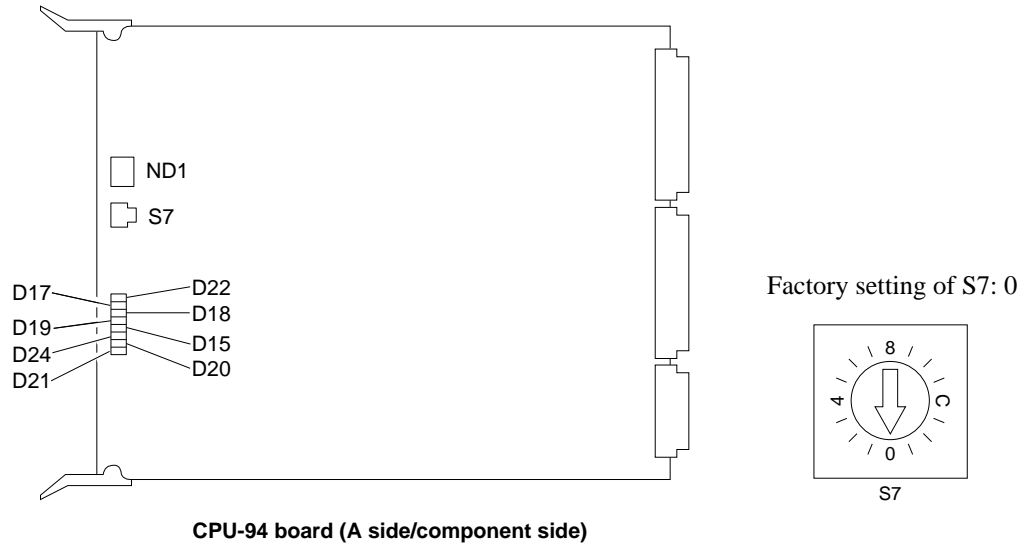


Section 3

Maintenance Mode

3-1. Mode Type

The BVS-A3232 has the multiple self-diagnostics functions (maintenance mode). The mode is changed with rotary switch S7 (TEST switch) on the CPU-94 board as shown below. The test result of each mode is shown in the error No. indicator (ND1) and the CPU indicators (D15, D17 through D22, and D24).



S7 Setting	Mode	Characteristics When Mode Is Started Up
0 to 5, 7	NORMAL (Refer to Section 3-2.)	The self-diagnostics are performed under operating conditions with the power ON.
6	Table Initialization (Refer to Section 3-3.)	
8, 9, A to F	TEST (Refer to Section 3-4.)	Only test functions run; the switching operations do not function.

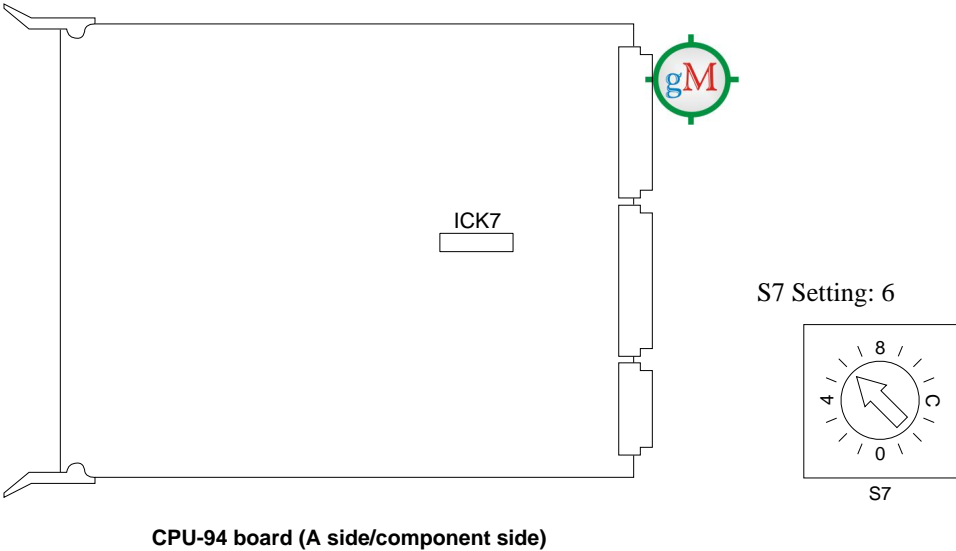
3-2. Normal Mode

In the NORMAL mode, the self-diagnostics are running on the BVS-A3232 under operating conditions. The following items are displayed depending upon the setting of S7. The setting of S7 can be changed during operation.

S7 Setting	Function
0	An error detected by the self-diagnostic program is shown in ND1 (7-segment LED). Refer to “3-5. Error Indications” for details of the error.
1	The station address of the destination which received the S-BUS signal is displayed in ND1. (01 to FF)
2	The count of all detected errors is represented by a hexadecimal and displayed in ND1. (01 to FF)
3 to 5, 7	Not used (Do not change the settings.)

3-3. Table Initialization Mode

When S7 is set to 6, the RAM ICK7 (TABLE DATA) on the CPU-94 board is initialized. An error detected by the self-diagnostics is shown in ND1 after completion of initialization, in the same way as when S7 is set to 0. Refer to “3-5. Error Indications” for details of the error.



3-4. Test Mode

Use the TEST mode to perform the following tests.

The normal switching functions are disabled while the TEST mode is running.

Notes

- When S7 is set to the TEST mode, make sure to either press the reset switch (S2) or turn the power off once and back on again.
- Set S7 to 0 and press S2 to return to switching operation.

S7 Setting	Test	Refer to Section
8	LED test	3-4-1
9	DIP switch and rotary switch test	3-4-2
A	—	—
B	Crosspoint test B	3-4-3
C	S-BUS (REMOTE 1) test	3-4-4
D	RS-232C (REMOTE 3) test	3-4-5
E	RS-422A (REMOTE 2) test	3-4-6
F	Buzzer test	3-4-7

3-4-1. LED Test

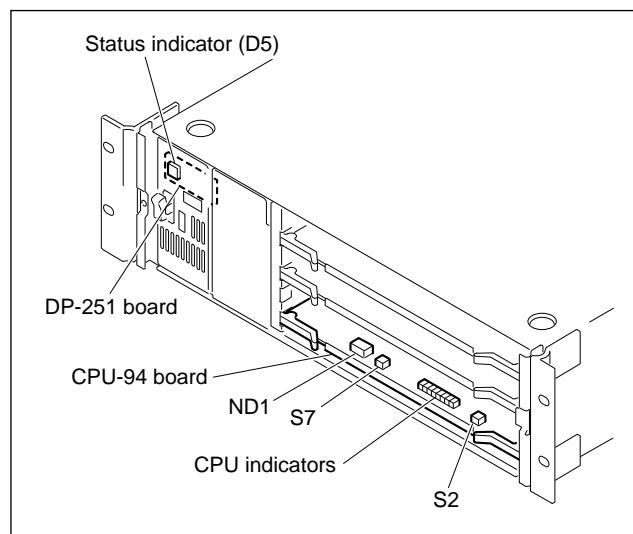
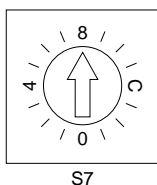
Use this test to check the following LEDs:

- Error No. indicator on the CPU-94 board (ND1)
- CPU indicators on the CPU-94 board (D15, D17 to D22, and D24)
- Status indicator (D5) on the DP-251 board

Set S7 to 8 and press S2 to start the test.

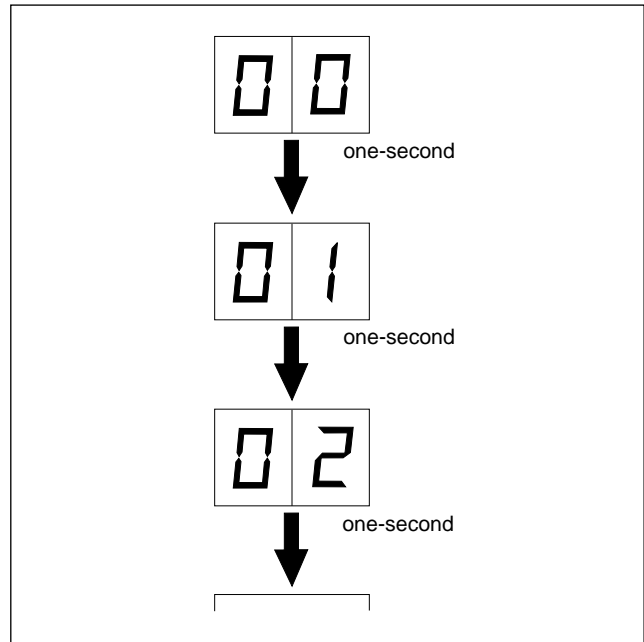
Check that the LEDs light in the specified pattern shown below.

S7 Setting: 8
(Press S2 after changing the setting.)



Display Pattern of ND1

- Numbers from 00 to 59 are displayed repeatedly at one-second intervals.

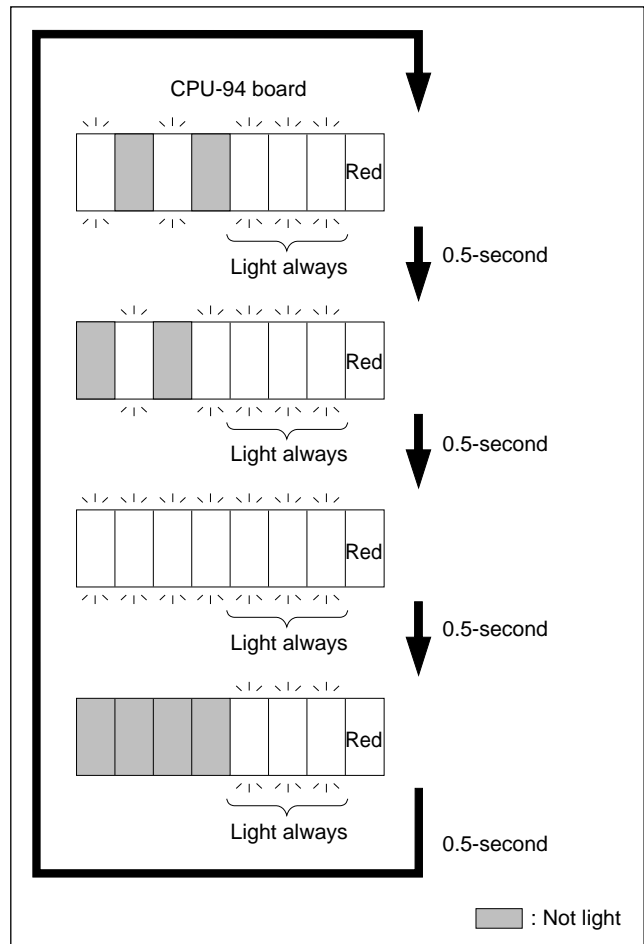


Lighting Pattern of the CPU Indicators

- D15, D17 to D22 and D24 on the CPU-94 board light in the specified pattern at 0.5-second intervals.

Lighting Pattern of the Status Indicator

- The LED (D5) which lights in green on the DP-251 board turns red once every two seconds.



3-4-2. DIP Switch and Rotary Switch Test

This test checks the switch circuit of the following switches on the CPU-94 board.

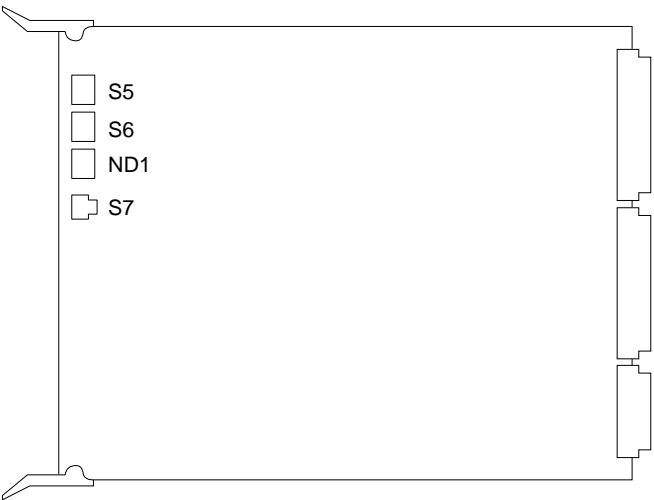
Set S7 to 9 and press S2 to start the test.

The switch setting is displayed in the order of S5 → S6 → S7 on ND1.

S5 (STATION ADR)

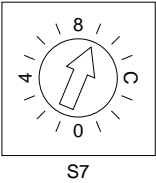
S6 (UNIT ADR)

S7 (TEST)



CPU-94 board (A side/component side)

S7 Setting: 9
(Press S2 after changing the setting.)



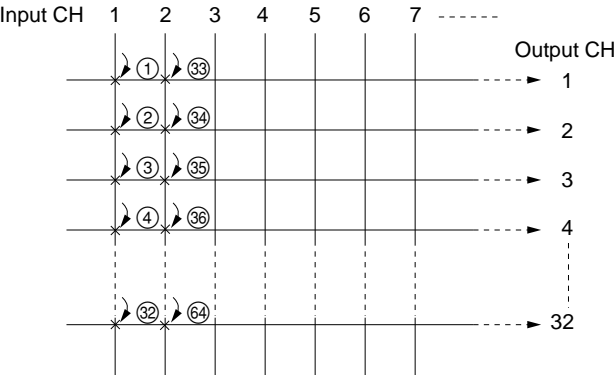
3-4-3. Crosspoint Test B

This test checks all circuits on the MX-82 board.

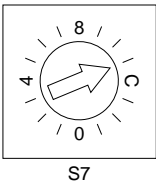
Set S7 to B and press S2 to start the test.

The crosspoint of the matrix circuit is changed in the following order:

On input CH1: Output CH1→Output CH2→Output CH3→.....→ Output CH32
On input CH2: Output CH1→Output CH2→Output CH3→...
⋮



S7 Setting: B
(Press S2 after changing the setting.)



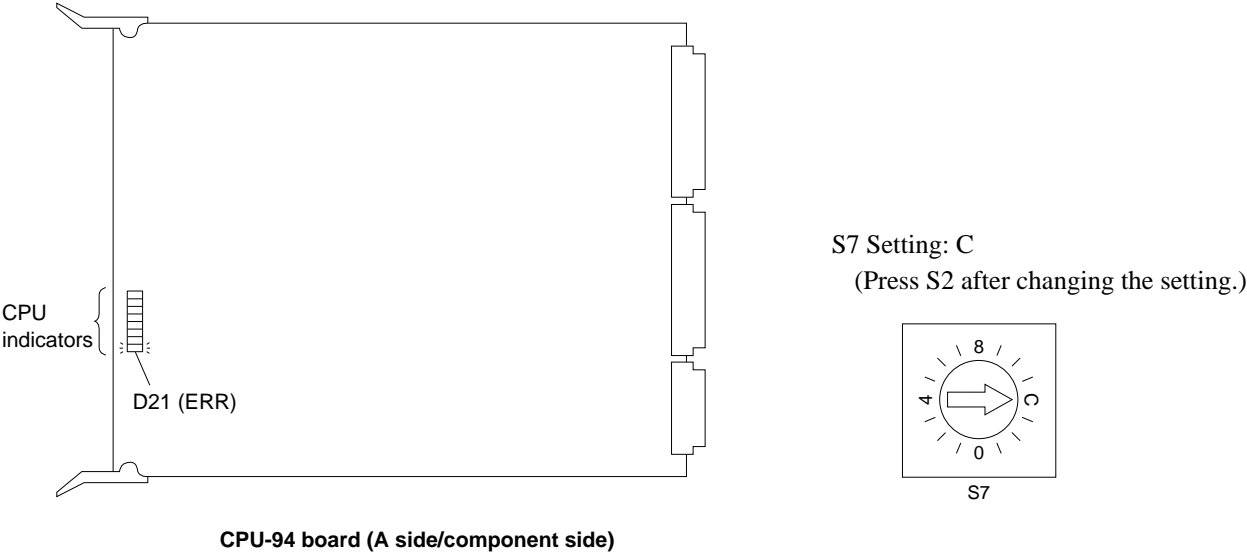
The number of the selected (connected) output channel currently is displayed on ND1 (01 through FF). This checks the signal transmission circuit.

3-4-4. S-BUS (REMOTE 1) Test

This test checks the control operation on the S-BUS.
Set S7 to C and press S2 to start the test.
When an operation error is detected, the D21 (ERR) on the CPU-94 board lights in red.

Note

Numbers appear in the order of 00, 11 and 22 up to FF on ND1 at about one-second intervals.



3-4-5. RS-232C (REMOTE 3) Test

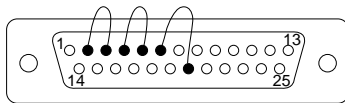
This test checks the control operation on RS-232C.
For this test, the following tool is needed:

Necessary parts

- D-SUB connector (25-pin, male)
- Soldering iron
- Jumper wire

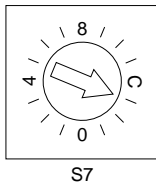
Procedure

Short pins 2 and 3, pins 4 and 5, and pins 6 and 20 of the D-SUB connector.



Test procedure

1. Set S7 to D.



2. Connect the D-SUB connector tool fabricated in the above procedure, to the REMOTE 3 terminal.
3. Press S2.
The data transmitted from this unit is received by itself and appears on ND1. The ND1 display and the test result are shown below.

ND1 Display	Test Result
Numbers from 00 to FF appear in order.	Normal
A fixed value appears. Example: 00	Error

3-4-6. RS-422A (REMOTE 2) Test

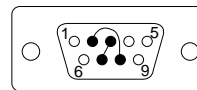
This test checks the control operation on RS-422A.
For this test, the following tool is needed:

Preparations

- D-SUB connector (9-pin, male)
- Soldering iron
- Jumper wire

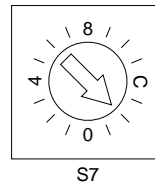
Procedure

Short pins 2 and 8, and pins 3 and 7 of the D-SUB connector.



Test procedure

1. Set S7 to E.



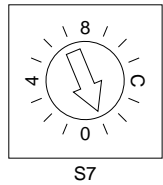
2. Connect the D-SUB connector tool fabricated in the above procedure, to the REMOTE 2 terminal.
3. Press S2.
The data transmitted from this unit is received by itself and appears on ND1. The ND1 display and the test result are shown below.

ND1 Display	Test Result
Numbers from 00 to FF appear in order.	Normal
A fixed value appears. Example: 00	Error

3-4-7. Buzzer Test

This test checks whether the buzzer (BZ1) on the CPU-94 board sounds normally or not.
Set S7 to F and press S2 to start the test.

S7 Setting: F
(Press S2 after changing the setting.)



3-5. Error Indications

The self-diagnosis starts when the main power is turned on or when reset. The self-diagnostics are performed periodically during normal operation. If an error is detected, the unit indicates it using the status indicator on the front panel or by sounding the buzzer, and outputs the error information to the control terminal. It also indicates the corresponding 2-digit error code using ND1 on the CPU-94 board so that you can approximately locate where the error occurred.

• Error Indications Displayed by the Status Indicator

LED Condition	Meaning of the Error
Lighting in green	The switcher is operating normally.
Flashing in green	Synchronizing signal was not detected.
Lighting in red	If both the CPU-94 board and backup CPU-94 board (BKDS-RS1690) are installed, the error indicates that some trouble occurred on one board and that operation was taken over by the other board. If both the power supply unit and backup power supply unit (BKDS-PA3291) are installed, the error indicates that the power output is not supplied from the unit which lamp is shutoff (no lamp lights up).
Flashing in red	One of the following errors was detected during self-diagnostics: <ul style="list-style-type: none">• The fan stopped.• The S-BUS data link is broken.
Shutoff	No power supply unit is installed. Or the power output is not supplied even though the power supply unit is installed.

• Error Codes Indicated by ND1

00 Normal operation

1X REMOTE 2 RS-422 (9-pin remote) Communication error

Number	Contents
11	Received NAK during send
12	Received a notification during send
13	Time-out occurred
14	Framing, parity or overrun error occurred
15	Checksum error occurred
16	Received NAK

2X REMOTE 1 S-BUS communication error

Number	Contents
21	Send error (occurs when data is sent from this unit and is received by itself.)
24	Communication error other than 27 (S-BUS data link is broken.) (FCS/OVERRUN/DMA)
27	S-BUS data link is broken. (Open)

3X REMOTE 3 Terminal communication error

Number	Contents
34	Received a break code.

42 Crosspoint hardware is defective.
Poor connection of board, or board is not installed into the slot.

50 Battery backup is defective.
This error occurs when the backup setting data is initialized at a reset start because an error was detected in the data. The display remains until the next reset signal is input.

6X Synchronizing signal is defective.

Number	Contents
60	Reference video signal is not input to the REF-VIDEO even though S1-1 is set to sync mode (SYNC).

70 Temperature rise or fan is defective.

80 ROM RAM EEPROM error
An error occurred when the ROM checksum test and RAM read test are performed immediately after reset, or a data read error occurred when setting is performed from the control terminal.

FF CPU board operation is defective.

Note

FF appears momentarily when reset, but this does not mean operating failure of the CPU board.

Section 4

Electrical Alignment

4-1. Power Supply Voltage Adjustment

Be sure to adjust the power supply voltage after replacing the switching regulator.
Adjust the power supply voltage of the optional power unit (BKDS-PA3291) in the same procedure, if required.

Equipment Required

- Digital voltmeter
- Adjustment screwdriver

Note

Use the equipments after calibration.

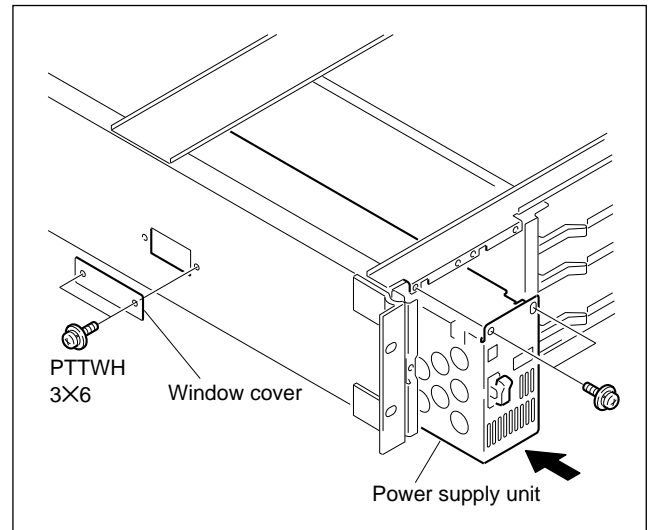
Preparation

1. Remove the top panel. (Refer to “2-1. Removal of Cabinet”.)
2. Insert the power supply unit to be adjusted into the slot. (Refer to Section 1-6.)

Note

Insert the power supply unit in the outer slot for adjustment.

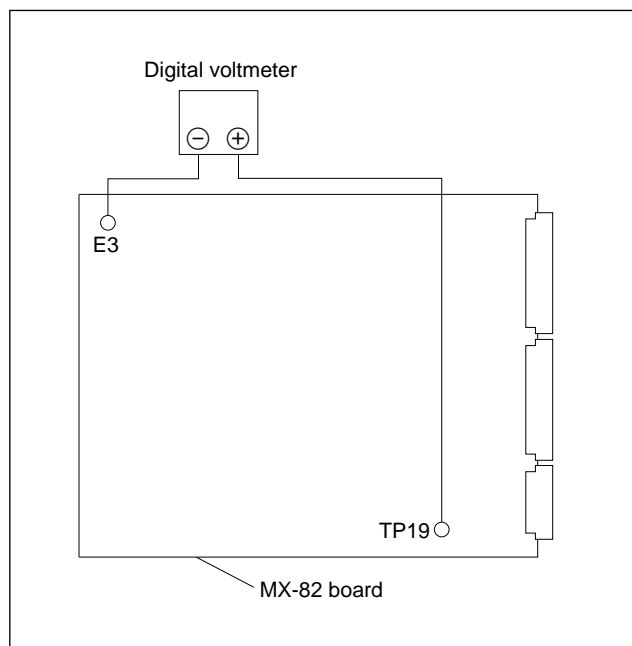
3. Remove the window cover at the side.



4-1-1. +5 V Adjustment

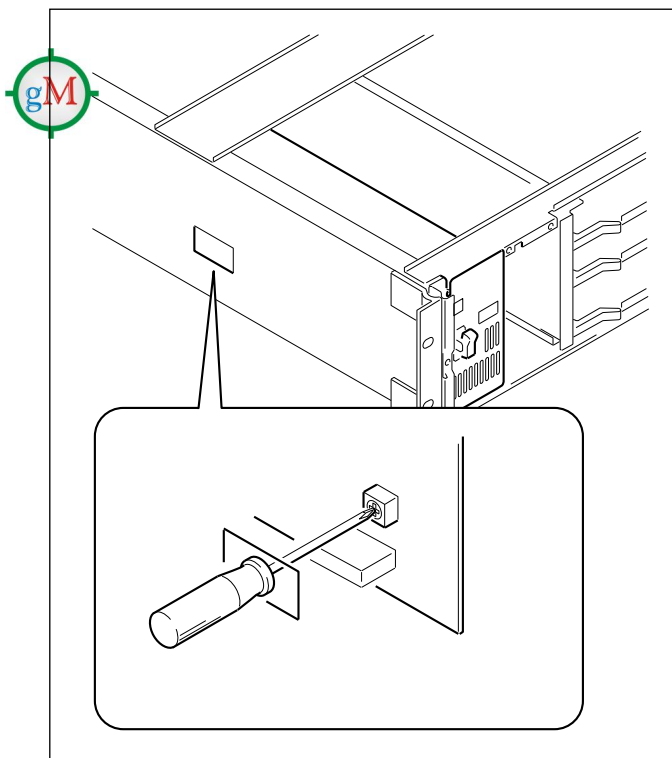
1. Connect a digital voltmeter to TP19 and E3 on the MX-82 board.

+ probe: TP19 (J-10)
– probe: E3 (A-1)/GND



2. Turn the adjustment control through the hole in the side panel of the BVS-A3232 until the specification below is satisfied.

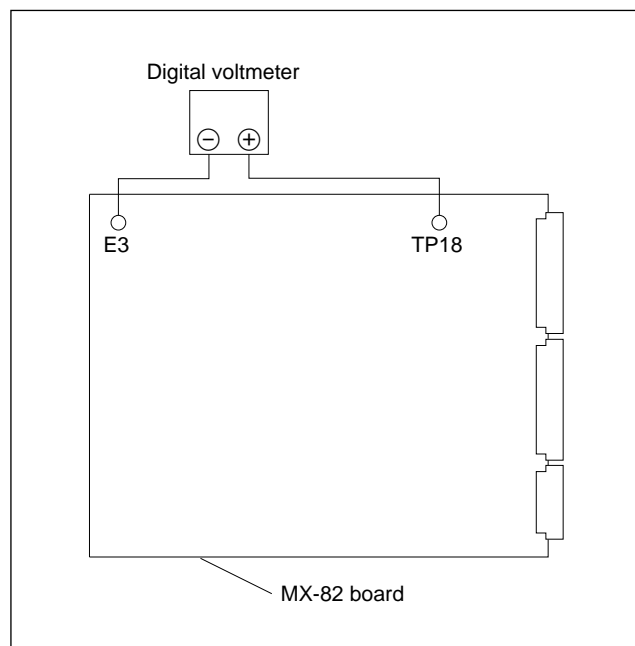
Specification: 5.00 ± 0.05 V



4-1-2. -15 V Adjustment

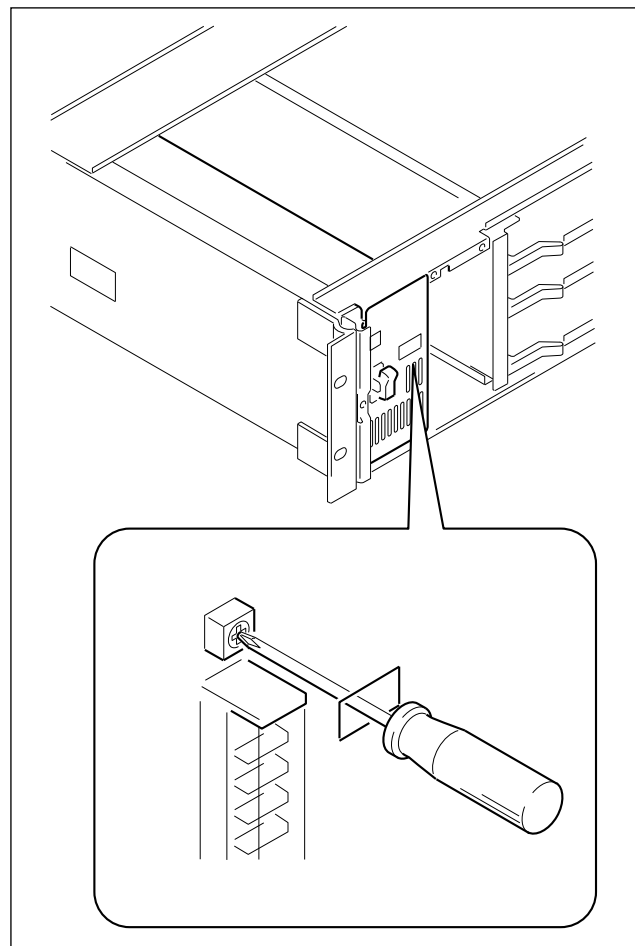
1. Connect a digital voltmeter to TP18 and E3 on the MX-82 board.

+ probe: TP18 (H-2)
– probe: E3 (A-1)/GND

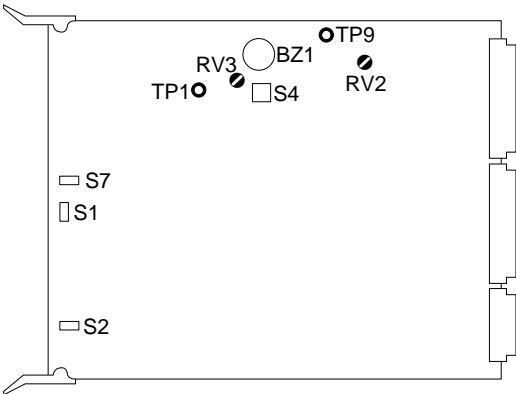


2. Turn the adjustment control through the hole in the front of the power supply unit until the specification below is satisfied.

Specification: $-15.50 \pm 0.05 \text{ V}$



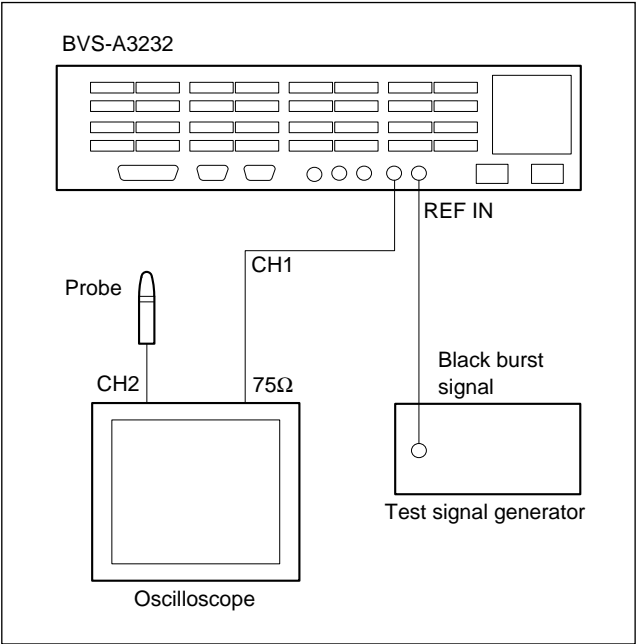
4-2. CPU-94 Board



Connection

Note

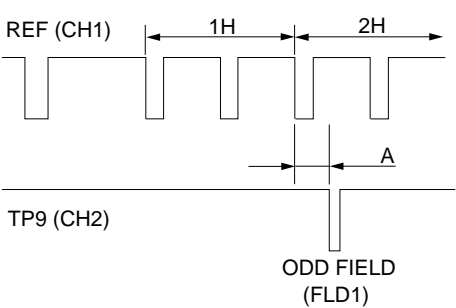
Use the equipments after calibration.



4-2-1. Crosspoint Phase Adjustment

[Equipment Required]

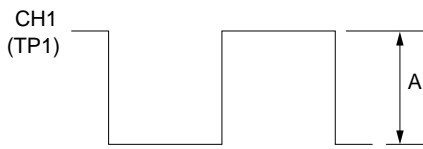
- Test signal generator (Sony Tektronix 1410 or equivalent; For U.S.A. and Canada area)
(Sony Tektronix 1411 or equivalent; For Europe area)
- Oscilloscope
- Probe
- Extension board (EX-351, Sony part No. : J-6185-310-A)

Adjustment Conditions	Specification	Adjustment Point
<ul style="list-style-type: none"> • Extend the CPU-94 board using the extension board (EX-351). • Set the switch S1-1 (A-8) on the CPU-94 board to the SYNC position. • Set the switch S4 (G-2) on the CPU-94 board to "1". • Oscilloscope settings <ul style="list-style-type: none"> CH1 : DC 0.5V/DIV CH2 : DC 2V/DIV TIME : 10 μs/DIV TRIG : CH1/TV-FLD1 mode 	<p>Measurement Point: TP9 (J-1) on CPU-94</p>  <p>Spec. ; $A = 21.0 \pm 0.2 \mu\text{s}$</p> <ul style="list-style-type: none"> • Adjust RV2 so that the timing from the rise up of the 2nd H satisfies specification A. 	<ul style="list-style-type: none"> • RV2 (L-1) on CPU-94

4-2-2. Buzzer Volume Adjustment

[Equipment Required]

- Oscilloscope
- Probe
- Extension board (EX-351, Part No. : J-6185-310-A)

Adjustment Conditions	Specification	Adjustment Point
<p>Step 1</p> <ul style="list-style-type: none"> • Extend the CPU-94 board using the extension board (EX-351). • Set S7 (A-5) on CPU-94 to F and press S2 (A-11) on CPU-94. • Check that the buzzer BZ1 (G-1) on the CPU-94 board sounds. • Connect CH1 of an oscilloscope to TP1 (E-2) on the CPU-94 board. • Oscilloscope settings <ul style="list-style-type: none"> CH1 : DC 2 V/DIV TIME : 1 ms/DIV TRIG : CH1 AUTO 	<p>Measurement Point: TP1 (E-2) on CPU-94</p>  <p>Spec. ; $A = 4.4 \pm 0.4 \text{ V}$</p> <ul style="list-style-type: none"> • Adjust RV3 to satisfy specification A. 	<ul style="list-style-type: none"> • RV3 (F-2) on CPU-94
<p>Step 2</p> <ul style="list-style-type: none"> • Install the CPU-94 board removed in step 1. 		

4-3. MX-82 Board

4-3-1. Adjustment Points List

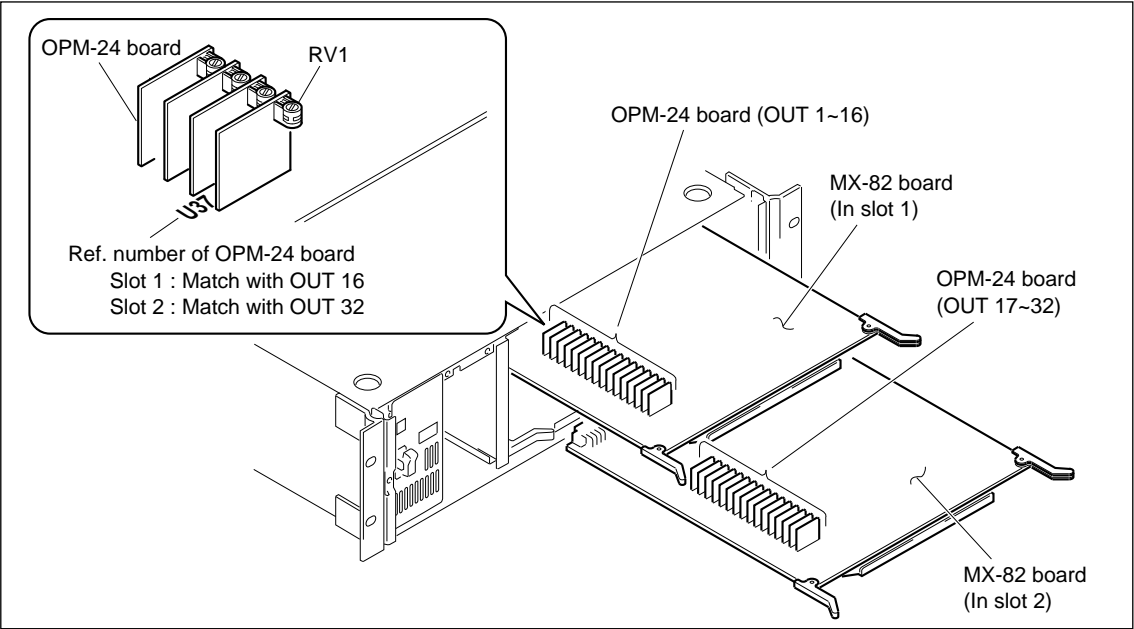
The 16 OPM-24 boards are mounted to one MX-82 board. Each OPM-24 board is assigned to one output connector (OUT). The matching between the OUT connectors and the OPM-24 boards is shown below.

Note

- OUT 1 to OUT 16 correspond to the MX-82 board in slot 1 while OUT 17 to OUT 32 correspond to the MX-82 board in slot 2.
- Each OPM-24 boards has a Ref. number shown on the MX-82 board to identify.

Slot 1	Slot 2	OPM-24 Board Ref. No.	Audio Level Adjustment
OUT 1	OUT 17	U20	RV1
OUT 2	OUT 18	U21	
OUT 3	OUT 19	U22	
OUT 4	OUT 20	U23	
OUT 5	OUT 21	U24	
OUT 6	OUT 22	U25	
OUT 7	OUT 23	U26	
OUT 8	OUT 24	U27	
OUT 9	OUT 25	U30	
OUT 10	OUT 26	U31	
OUT 11	OUT 27	U32	
OUT 12	OUT 28	U33	
OUT 13	OUT 29	U34	
OUT 14	OUT 30	U35	
OUT 15	OUT 31	U36	
OUT 16	OUT 32	U37	

Board Layout



* Use the extension board for adjustment.

4-3-2. Audio Level Adjustment

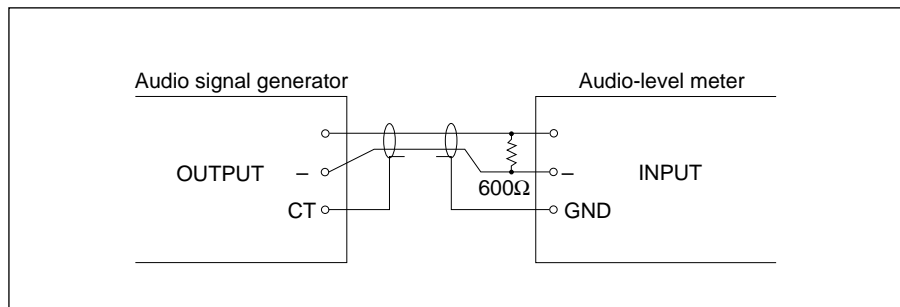
Equipment Required

- Audio signal generator: Sony Tektronix SG505 or equivalent
- Audio-level meter: Sony Tektronix AA501A (Audio analyzer) or equivalent
- Extension board (EX-351, Sony part No. : J-6185-310-A)

Setting Before Adjustment

• Setting the audio signal generator

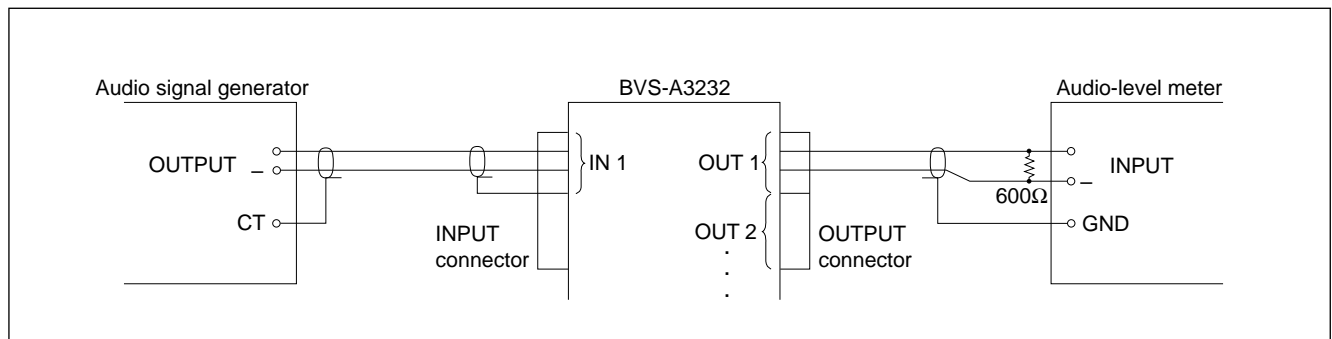
1. Set the audio signal generator as follows:
Output impedance $600\ \Omega$
FLOATING/GND FLOATING
Frequency 1 kHz
2. Connect an audio signal generator.
3. Set the output level of an audio signal generator to +4 dBm (1.228 V).



• Setting Input and Output Channels

All output channels must select the same input (IN 1) then adjust each output channel.

Connect a remote control unit, control terminal and peripheral devices. Set all channels so that the IN 1 feeds the OUT of all channels. (Refer to the supplied installation manual for software.)



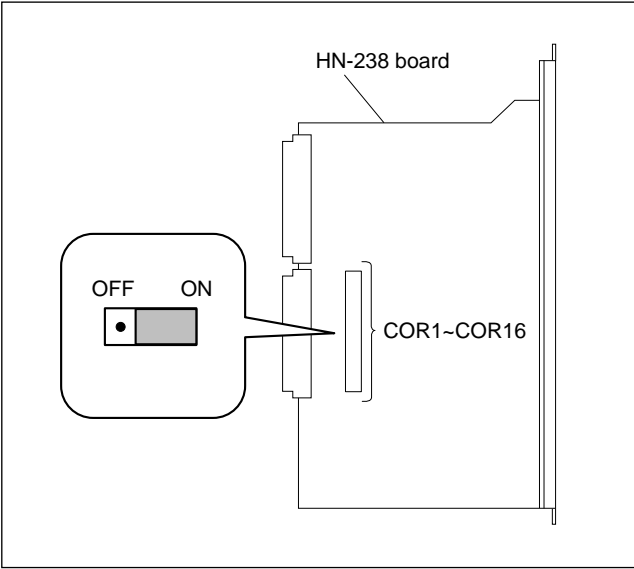
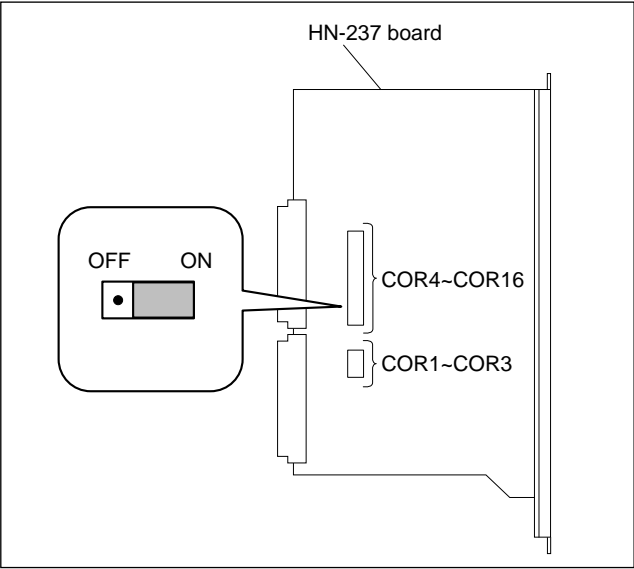
• **Switch Setting**

Set all of the following switches to ON position for setting of the terminal resistance value to 600 Ω.

COR1 to COR16 on the HN-237 board

COR1 to COR16 on the HN-238 board

(Factory setting: All ON)



Adjustment Conditions (For OUT 1)	Specification	Adjustment Point
<ul style="list-style-type: none">• Connect output of an audio signal generator to IN 1. Connect an audio-level meter to OUT 1.	<ul style="list-style-type: none">• Adjust RV1 for $+4 \pm 0.1$ dBm (1.228 ± 0.014 V) on audio-level meter.	<ul style="list-style-type: none">● RV1 on OPM-24 board (U20)

As for the adjustments of OUT 2 through OUT 32, connect the audio-level meter to each connector (OUT 2 to OUT 32) to be adjusted. (Refer to Section 4-3-1.) Adjust audio level of the respective channels in the same way.

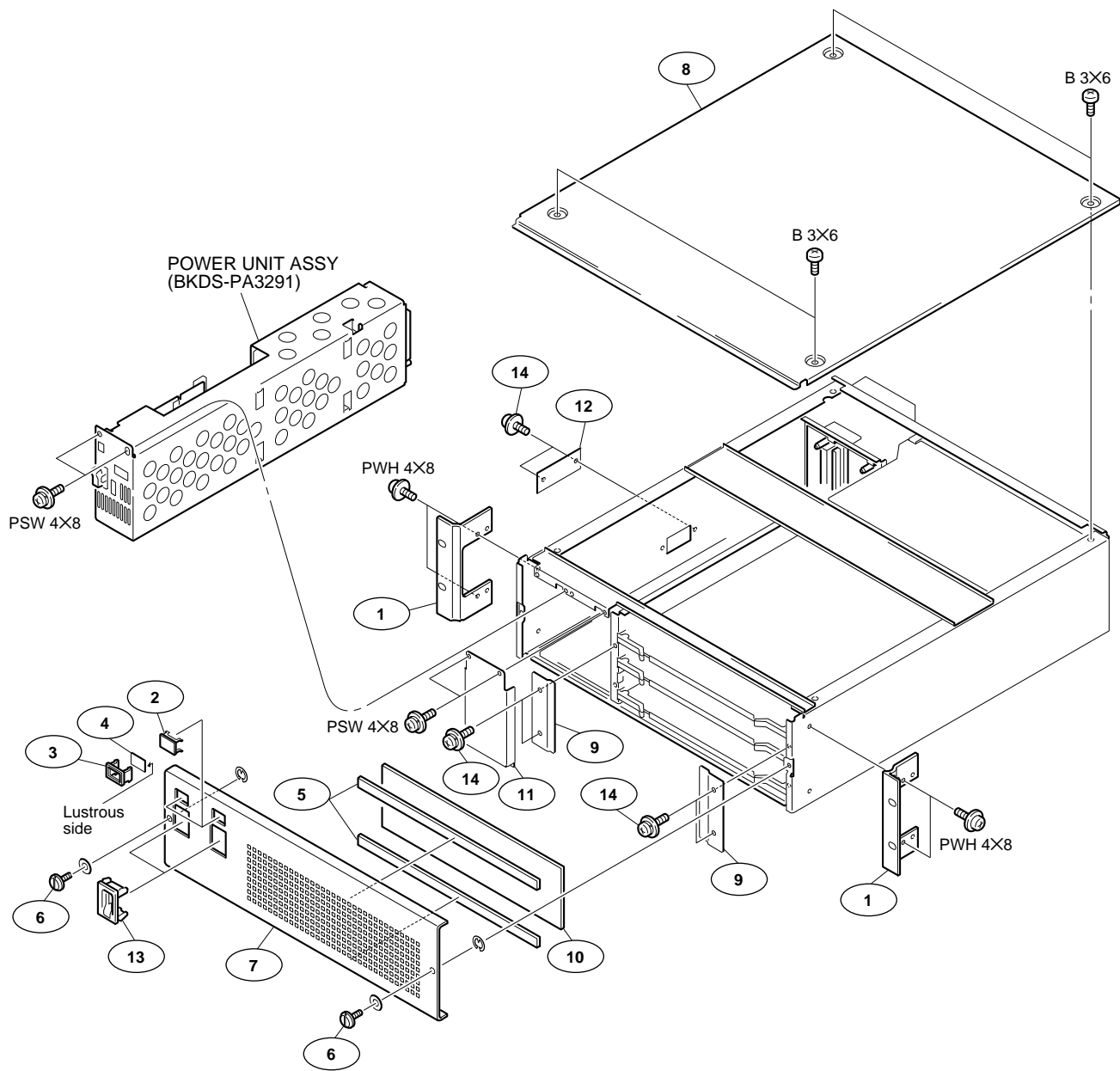
Section 5
Spare Parts

5-1. Exploded Views

Index	Page
Front Panel	5-2
• Top Plate	
• Front Panel	
• Angle	
Power Supply Unit & Plug-In Board	5-4
• CPU-94 Board	
• MX-82 Board	
• PS-453 Board	
• Switching Regulator	
Rear Panel	5-6
• MB-721 Board	
• CN Panel (CPU)	
• CN Panel (AU) (A)	
• CN Panel (AU) (B)	
• Fan	
• Rear Panel	

Front Panel

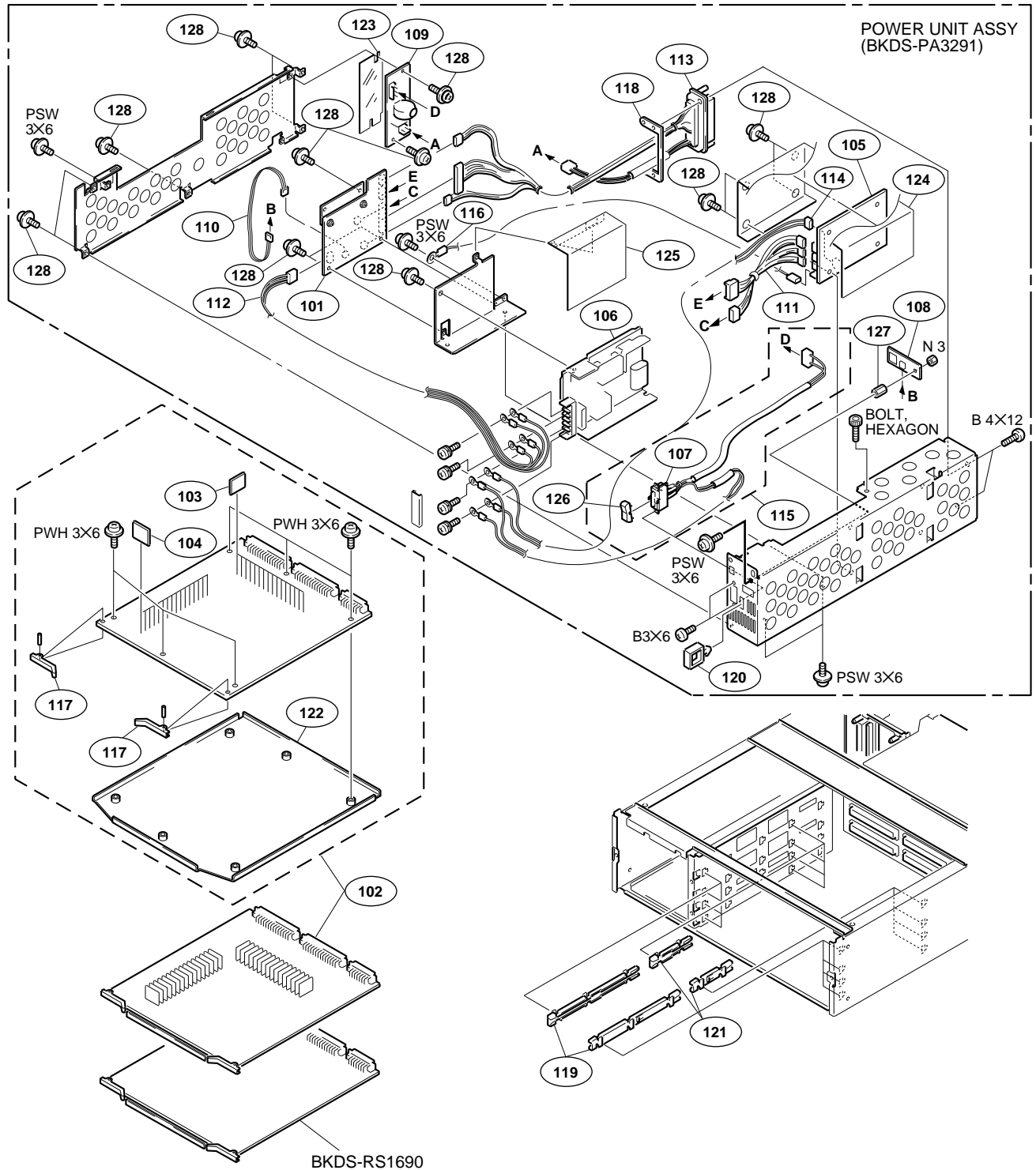
No.	Part No.	SP Description
1	X-3167-690-1	o ANGLE ASSY (3U), RACK
2	2-139-192-01	s FRAME, INDICATOR WINDOW
3	2-139-193-02	s WINDOW, INDICATOR
4	2-249-353-00	s COVER, LAMP
5	3-166-743-21	o TAPE, ADHESIVE
6	3-183-548-02	s SCREW, PANEL SWITCHING
7	3-191-021-11	o PANEL, FRONT
8	3-191-027-01	o PLATE, TOP
9	3-191-037-01	o BOARD, PC
10	3-191-038-01	o FILTER (3U)
11	3-191-042-01	o PANEL, BLANK
12	3-191-326-01	o COVER, ADJUSTMENT WINDOW
13	3-681-054-01	o POWER SW GUARD
14	4-886-821-11	s SCREW, S TIGHT, +PTTWH 3X6



Power Supply Unit & Plug-In Board

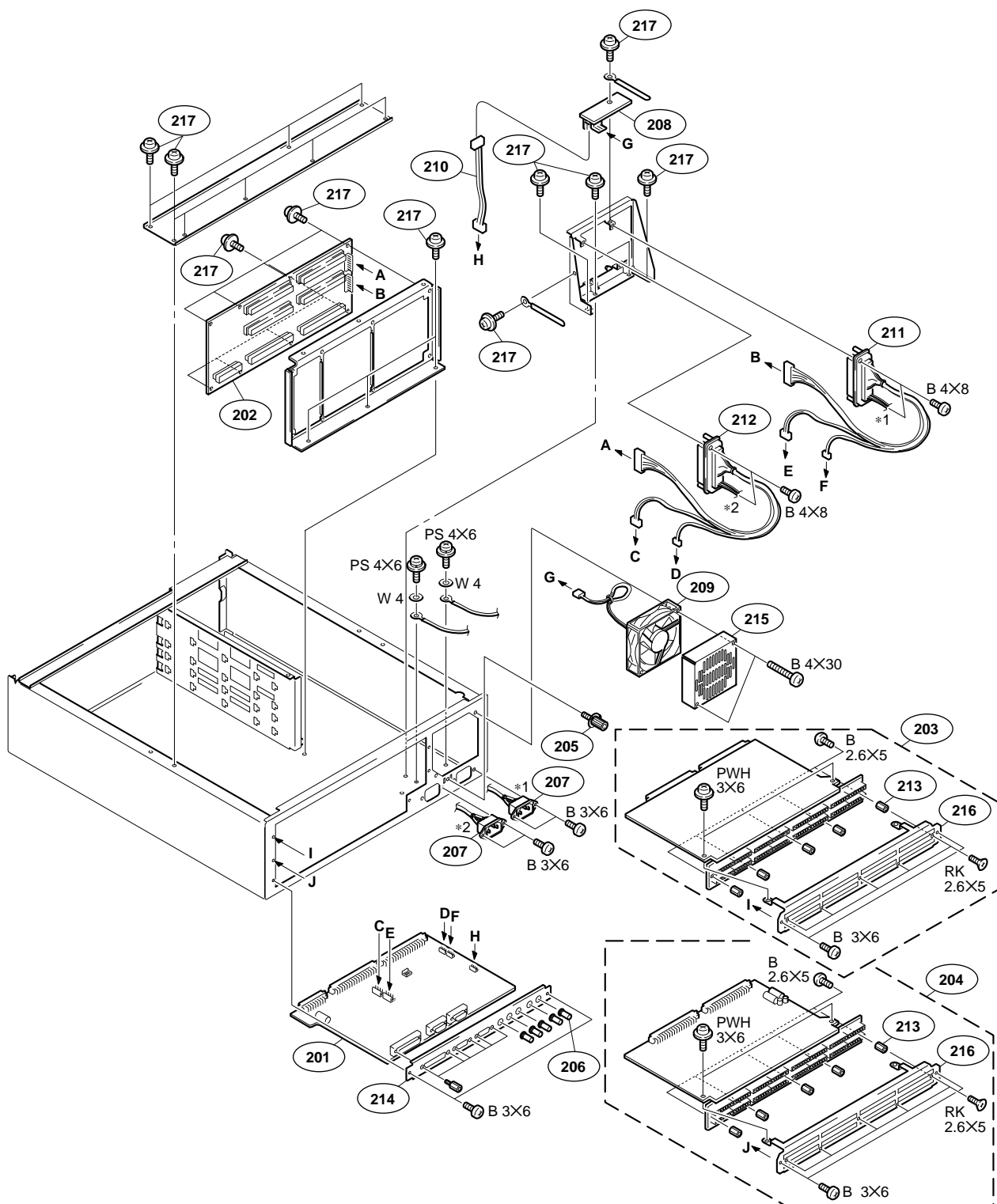
No.	Part No.	SP Description
101	A-8277-546-A	o MOUNTED CIRCUIT BOARD, PS-453
102	A-8277-577-A	o MOUNTED CIRCUIT BOARD, MX-82
103	A-8277-579-A	o MOUNTED CIRCUIT BOARD, IPM-80
104	A-8277-580-A	o MOUNTED CIRCUIT BOARD, OPM-24
105	△ 1-413-950-11	s REGULATOR, SWITCHING
106	△ 1-468-144-11	s REGULATOR, SWITCHING
107	1-570-117-41	s SWITCH, SEESAW (AC POWER)
108	1-661-803-11	o PRINTED CIRCUIT BOARD, DP-251
109	1-661-804-11	o PRINTED CIRCUIT BOARD, FL-235
110	1-956-392-11	o HARNESS (LED)
111	1-956-399-11	o HARNESS (+15V)
112	1-956-400-11	o HARNESS (-15V)
113	△ 1-956-401-11	o HARNESS (DRAWER-A)
114	△ 1-956-402-11	o HARNESS (AC-A)
115	△ 1-956-403-11	o HARNESS (SW-A)
116	1-956-493-11	o HARNESS (GND)
117	3-166-184-01	o LEVER, PC BOARD
118	3-166-190-12	s NUT, PLATE
119	3-169-099-01	o RAIL, PC BOARD GUIDE
120	3-172-089-01	o HANDLE
121	3-174-468-01	o RAIL (60), PC BOARD GUIDE
122	3-174-853-01	o PLATE, SHIELD
123	3-191-039-01	o SHEET, FL PC BOARD
124	3-191-045-01	o SHEET, +15V POWER
125	3-191-046-01	o SHEET, - 15V POWER
126	3-688-814-01	s CAP, SWITCH
127	3-880-616-00	o BOSS
128	4-886-821-11	s SCREW, S TIGHT, +PTTWH 3X6





Rear Panel

No.	Part No.	SP Description
201	A-8277-562-A	o MOUNTED CIRCUIT BOARD, CN-1388
202	A-8277-574-A	o MOUNTED CIRCUIT BOARD, MB-721
203	A-8277-581-A	o PANEL (AU) (A) ASSY, CN
204	A-8277-584-A	o PANEL (AU) (B) ASSY, CN
205	X-2068-004-0	s TERMINAL ASSY
206	1-568-812-11	s CONNECTOR, BNC
207	1-580-375-11	s INLET 3P
208	1-661-811-11	o PRINTED CIRCUIT BOARD, DUS-971
209	1-698-379-11	s MOTOR, DC FAN
210	1-956-386-11	o HARNESS (FAN)
211	△ 1-956-387-11	o HARNESS (ACIN-A)
212	△ 1-956-388-11	o HARNESS (ACIN-B)
213	3-171-677-01	o SUPPORT, HEXAGON
214	3-191-029-02	o PANEL (CPU), CN
215	3-191-041-01	o COVER, FAN
216	3-191-048-11	o PANEL (AU), CN
217	4-886-821-11	s SCREW, S TIGHT, +PTTWH 3X6



5-2. Electrical Parts List

CAPACITOR, ELECT

Part No.	SP Description
1-128-551-11	s ELECT 22uF 20% 63V

CAPACITOR, CERAMIC

Part No.	SP Description
1-161-494-00	s CERAMIC 0.022uF 25V

NOTE : Please see page 5-8 for the parts that are not listed
in the parts list.

----- CN-1388 BOARD -----			
Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8277-562-A	o	MOUNTED CIRCUIT BOARD, CN-1388
3pcs	4-352-844-01	o	PIN, LEAD, COATING
6pcs	7-682-548-04	s	SCREW +B 3X8
2pcs	7-685-647-79	s	SCREW +BTP 3X10 TYPE2 N-S
C1	1-163-038-91	s	CERAMIC 0.1uF 25V
C2	1-124-584-00	s	ELECT 100uF 20% 10V
C3	1-163-038-91	s	CERAMIC 0.1uF 25V
C4	1-107-890-11	s	ELECT 2200uF 20% 25V
C6	1-163-038-91	s	CERAMIC 0.1uF 25V
C7	1-163-038-91	s	CERAMIC 0.1uF 25V
C8	1-124-584-00	s	ELECT 100uF 20% 10V
C9	1-126-157-11	s	ELECT 10uF 20% 16V
C10	1-163-038-91	s	CERAMIC 0.1uF 25V
C11	1-163-038-91	s	CERAMIC 0.1uF 25V
C12	1-164-346-11	s	CERAMIC 1uF 16V
C13	1-164-346-11	s	CERAMIC 1uF 16V
C14	1-164-346-11	s	CERAMIC 1uF 16V
C15	1-164-346-11	s	CERAMIC 1uF 16V
CN1	1-774-986-11	o	HOUSING, 96P
CN2	1-774-986-11	o	HOUSING, 96P
CN8	1-563-770-11	o	CONNECTOR, D-SUB 9P, FEMALE
CN9	1-563-770-11	o	CONNECTOR, D-SUB 9P, FEMALE
CN10	1-563-772-11	o	CONNECTOR, D-SUB 25P, FEMALE
CN11	1-564-013-11	o	CONNECTOR 3P, MALE
CN20	1-564-241-11	o	CONNECTOR, B4P-VH 4P, MALE
CN21	1-564-241-11	o	CONNECTOR, B4P-VH 4P, MALE
CN22	1-506-702-11	o	CONNECTOR, ILG 3P, MALE
CN23	1-506-703-11	o	CONNECTOR, ILG 4P, MALE
CN24	1-506-704-11	o	CONNECTOR, ILG 5P, MALE
CN33	1-563-339-11	o	CONNECTOR, DIN 48P, FEMALE
D1	8-719-800-76	s	DIODE 1SS226
D2	8-719-800-76	s	DIODE 1SS226
IC1	8-759-925-80	s	IC SN74HC14ANS
IC2	8-759-252-59	s	IC MAX202CSE-TE2
IC3	8-759-926-11	s	IC SN74HC138ANS
IC4	8-759-925-76	s	IC SN74HC08ANS
IC5	8-759-926-77	s	IC SN74HC541ANS
L1	1-410-799-41	s	INDUCTOR 0.022uH
L2	1-410-799-41	s	INDUCTOR 0.022uH
L3	1-412-525-31	s	INDUCTOR 10uH
Q1	8-729-216-22	s	TRANSISTOR 2SA1162
R1	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R2	1-216-687-11	s	METAL, CHIP 33K 0.5% 1/10W
R3	1-208-806-11	s	METAL, CHIP 10K 0.5% 1/10W
R4	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R5	1-208-822-11	s	METAL, CHIP 47K 0.5% 1/10W
R6	1-208-814-11	s	METAL, CHIP 22K 0.5% 1/10W
R7	1-208-806-11	s	METAL, CHIP 10K 0.5% 1/10W
R8	1-208-814-11	s	METAL, CHIP 22K 0.5% 1/10W
R9	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R10	1-208-854-11	s	METAL, CHIP 1M 0.5% 1/10W
R11	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R12	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R13	1-208-806-11	s	METAL, CHIP 10K 0.5% 1/10W
R14	1-208-806-11	s	METAL, CHIP 10K 0.5% 1/10W

----- CNB-10 BOARD -----			
Ref. No. or Q'ty	Part No.	SP	Description
64pcs	7-685-102-19	s	SCREW +P 2X4 TYPE2 NON-SLIT
CN1	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN1	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN2	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN2	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN3	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN3	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN4	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN4	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN5	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN5	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN6	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN6	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN7	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN7	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN8	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN8	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN11	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN11	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN12	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN12	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN13	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN13	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN14	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN14	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN15	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN15	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN16	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN16	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN16	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN17	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN17	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN18	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN18	1-778-701-11	o	CONNECTOR RECEPTACLE 6P
CN20	1-566-096-11	s	CONNECTOR, BB12P, MALE
CN20	1-566-096-11	s	CONNECTOR, BB12P, MALE
CN21	1-566-096-11	s	CONNECTOR, BB12P, MALE
CN21	1-566-096-11	s	CONNECTOR, BB12P, MALE
CN22	1-566-096-11	s	CONNECTOR, BB12P, MALE
CN22	1-566-096-11	s	CONNECTOR, BB12P, MALE
CN23	1-566-096-11	s	CONNECTOR, BB12P, MALE
CN23	1-566-096-11	s	CONNECTOR, BB12P, MALE
CN24	1-566-096-11	s	CONNECTOR, BB12P, MALE
CN24	1-566-096-11	s	CONNECTOR, BB12P, MALE

NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

CPU-94 BOARD(BVS-A3232/BKDS-RS1690)

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-540-069-11	s SOCKET, IC (IC113) 84P
1pc	1-526-660-21	o SOCKET, IC 32P
2pcs	1-526-656-00	s SOCKET, IC (DP) 20P
1pc	1-526-659-00	o SOCKET, IC 28P
1pc	1-526-656-00	s SOCKET, IC (DP) 20P
2pcs	3-166-184-01	o LEVER, PC BOARD
1pc	3-174-853-01	o PLATE, SHIELD
6pcs	7-682-903-11	s SCREW +PWH 3X6
2pcs	7-626-320-11	s PIN, SPRING 3X8
BT1	1-528-202-11	s BATTERY, NICKEL-CADMIUM
BZ1	1-529-025-00	s BUZZER
C1	1-162-302-11	s CERAMIC 0.0022uF 20% 16V
C2	1-161-485-00	s CERAMIC 0.1uF 50V
C3	1-126-163-11	s ELECT 4.7uF 20% 50V
C4	1-162-302-11	s CERAMIC 0.0022uF 20% 16V
C5	1-161-485-00	s CERAMIC 0.1uF 50V
C6	1-126-163-11	s ELECT 4.7uF 20% 50V
C7	1-162-302-11	s CERAMIC 0.0022uF 20% 16V
C8	1-161-485-00	s CERAMIC 0.1uF 50V
C9	1-126-163-11	s ELECT 4.7uF 20% 50V
C10	1-162-302-11	s CERAMIC 0.0022uF 20% 16V
C11	1-161-485-00	s CERAMIC 0.1uF 50V
C12	1-126-163-11	s ELECT 4.7uF 20% 50V
C13	1-162-211-31	s CERAMIC 33PF 5% 50V
C14	1-162-211-31	s CERAMIC 33PF 5% 50V
C15	1-161-485-00	s CERAMIC 0.1uF 50V
C16	1-161-485-00	s CERAMIC 0.1uF 50V
C17	1-126-162-11	s ELECT 3.3uF 20% 50V
C18	1-126-162-11	s ELECT 3.3uF 20% 50V
C19	1-161-485-00	s CERAMIC 0.1uF 50V
C20	1-124-584-00	s ELECT 100uF 20% 10V
C21	1-161-485-00	s CERAMIC 0.1uF 50V
C22	1-161-485-00	s CERAMIC 0.1uF 50V
C23	1-126-162-11	s ELECT 3.3uF 20% 50V
C25	1-162-288-31	s CERAMIC 330PF 10% 50V
C26	1-161-485-00	s CERAMIC 0.1uF 50V
C27	1-161-485-00	s CERAMIC 0.1uF 50V
C28	1-124-584-00	s ELECT 100uF 20% 10V
C29	1-124-584-00	s ELECT 100uF 20% 10V
C30	1-124-584-00	s ELECT 100uF 20% 10V
C31	1-124-584-00	s ELECT 100uF 20% 10V
C32	1-161-485-00	s CERAMIC 0.1uF 50V
C33	1-161-485-00	s CERAMIC 0.1uF 50V
C34	1-124-584-00	s ELECT 100uF 20% 10V
C35	1-161-485-00	s CERAMIC 0.1uF 50V
C36	1-161-485-00	s CERAMIC 0.1uF 50V
C37	1-161-485-00	s CERAMIC 0.1uF 50V
C38	1-126-153-11	s ELECT 22uF 20% 6.3V
C39	1-161-888-11	s CERAMIC 0.01uF 50V
C40	1-161-485-00	s CERAMIC 0.1uF 50V
C41	1-161-485-00	s CERAMIC 0.1uF 50V
C42	1-162-203-31	s CERAMIC 15PF 5% 50V
C43	1-162-203-31	s CERAMIC 15PF 5% 50V
C44	1-161-485-00	s CERAMIC 0.1uF 50V
C45	1-161-485-00	s CERAMIC 0.1uF 50V
C46	1-124-584-00	s ELECT 100uF 20% 10V
C47	1-126-163-11	s ELECT 4.7uF 20% 50V

(CPU-94 BOARD(BVS-A3232/BKDS-RS1690))

Ref. No. or Q'ty	Part No.	SP Description
C48	1-161-485-00	s CERAMIC 0.1uF 50V
C49	1-161-485-00	s CERAMIC 0.1uF 50V
C50	1-126-157-11	s ELECT 10uF 20% 16V
C51	1-161-485-00	s CERAMIC 0.1uF 50V
C52	1-162-302-11	s CERAMIC 0.0022uF 20% 16V
C53	1-126-157-11	s ELECT 10uF 20% 16V
C54	1-126-163-11	s ELECT 4.7uF 20% 50V
C55	1-161-485-00	s CERAMIC 0.1uF 50V
C56	1-161-485-00	s CERAMIC 0.1uF 50V
C58	1-161-485-00	s CERAMIC 0.1uF 50V
C59	1-161-485-00	s CERAMIC 0.1uF 50V
C60	1-162-211-31	s CERAMIC 33PF 5% 50V
C61	1-162-211-31	s CERAMIC 33PF 5% 50V
C62	1-162-286-21	s CERAMIC 220PF 10% 50V
C63	1-161-485-00	s CERAMIC 0.1uF 50V
C64	1-126-160-11	s ELECT 1uF 20% 50V
C65	1-126-160-11	s ELECT 1uF 20% 50V
C66	1-126-157-11	s ELECT 10uF 20% 16V
C67	1-126-160-11	s ELECT 1uF 20% 50V
C68	1-126-160-11	s ELECT 1uF 20% 50V
C71	1-124-584-00	s ELECT 100uF 20% 10V
C72	1-161-485-00	s CERAMIC 0.1uF 50V
C73	1-162-286-21	s CERAMIC 220PF 10% 50V
C74	1-162-282-31	s CERAMIC 100PF 10% 50V
C75	1-161-485-00	s CERAMIC 0.1uF 50V
C76	1-161-485-00	s CERAMIC 0.1uF 50V
C77	1-161-485-00	s CERAMIC 0.1uF 50V
C79	1-162-282-31	s CERAMIC 100PF 10% 50V
C80	1-126-154-11	s ELECT 47uF 20% 6.3V
C201	1-161-485-00	s CERAMIC 0.1uF 50V
C202	1-161-485-00	s CERAMIC 0.1uF 50V
C203	1-161-485-00	s CERAMIC 0.1uF 50V
C204	1-161-485-00	s CERAMIC 0.1uF 50V
C205	1-161-485-00	s CERAMIC 0.1uF 50V
C206	1-161-485-00	s CERAMIC 0.1uF 50V
C207	1-161-485-00	s CERAMIC 0.1uF 50V
C209	1-161-485-00	s CERAMIC 0.1uF 50V
C211	1-161-485-00	s CERAMIC 0.1uF 50V
C212	1-161-485-00	s CERAMIC 0.1uF 50V
C213	1-161-485-00	s CERAMIC 0.1uF 50V
C214	1-161-485-00	s CERAMIC 0.1uF 50V
C215	1-161-485-00	s CERAMIC 0.1uF 50V
C216	1-161-485-00	s CERAMIC 0.1uF 50V
C217	1-161-485-00	s CERAMIC 0.1uF 50V
C218	1-161-485-00	s CERAMIC 0.1uF 50V
C219	1-161-485-00	s CERAMIC 0.1uF 50V
C220	1-161-485-00	s CERAMIC 0.1uF 50V
C221	1-161-485-00	s CERAMIC 0.1uF 50V
C222	1-161-485-00	s CERAMIC 0.1uF 50V
C232	1-161-485-00	s CERAMIC 0.1uF 50V
C233	1-161-485-00	s CERAMIC 0.1uF 50V
C234	1-161-485-00	s CERAMIC 0.1uF 50V
C250	1-126-154-11	s ELECT 47uF 20% 6.3V
C251	1-126-154-11	s ELECT 47uF 20% 6.3V
C300	1-161-485-00	s CERAMIC 0.1uF 50V
C301	1-161-485-00	s CERAMIC 0.1uF 50V
C302	1-161-485-00	s CERAMIC 0.1uF 50V
C303	1-161-485-00	s CERAMIC 0.1uF 50V
C304	1-161-485-00	s CERAMIC 0.1uF 50V

NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

(CPU-94 BOARD(BVS-A3232/BKDS-RS1690))

Ref. No. or Q'ty	Part No.	SP	Description
C305	1-161-485-00	s	CERAMIC 0.1uF 50V
C526	1-162-302-11	s	CERAMIC 0.0022uF 20% 16V
C527	1-161-485-00	s	CERAMIC 0.1uF 50V
C531	1-161-485-00	s	CERAMIC 0.1uF 50V
CN1	1-568-144-11	o	CONNECTOR, DIN 96P, MALE
CN2	1-568-144-11	o	CONNECTOR, DIN 96P, MALE
CN3	1-569-465-11	o	CONNECTOR, DIN 48P, MALE
COP1	1-562-579-21	s	PLUG, SHORTING
COR1	1-564-948-21	o	PIN, SHORTING
D1	8-719-911-19	s	DIODE 1SS119
D2	8-719-911-19	s	DIODE 1SS119
D3	8-719-911-19	s	DIODE 1SS119
D4	8-719-911-19	s	DIODE 1SS119
D5	8-719-911-19	s	DIODE 1SS119
D6	8-719-911-19	s	DIODE 1SS119
D7	8-719-911-19	s	DIODE 1SS119
D8	8-719-911-19	s	DIODE 1SS119
D9	8-719-911-19	s	DIODE 1SS119
D10	8-719-911-19	s	DIODE 1SS119
D14	8-719-911-19	s	DIODE 1SS119
D15	8-719-974-41	s	LED HLMP-6500-010, GRN
D16	8-719-911-19	s	DIODE 1SS119
D17	8-719-974-41	s	LED HLMP-6500-010, GRN
D18	8-719-974-41	s	LED HLMP-6500-010, GRN
D19	8-719-974-41	s	LED HLMP-6500-010, GRN
D20	8-719-974-41	s	LED HLMP-6500-010, GRN
D21	8-719-974-39	s	LED HLMP-6300-010, RED
D22	8-719-974-41	s	LED HLMP-6500-010, GRN
D24	8-719-974-41	s	LED HLMP-6500-010, GRN
D26	8-719-911-19	s	DIODE 1SS119
D29	8-719-911-19	s	DIODE 1SS119
FL1	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL2	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL3	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL4	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL5	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL6	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL7	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL8	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL9	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL10	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL11	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL12	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL13	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL14	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL15	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL16	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL17	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL18	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL19	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL300	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL301	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL302	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL303	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
FL304	1-236-058-21	s	ENCAPSULATED COMPONENTS, LC
ICB4	8-759-044-95	s	IC MC14495P

(CPU-94 BOARD(BVS-A3232/BKDS-RS1690))

Ref. No. or Q'ty	Part No.	SP	Description
ICB5	8-759-044-95	s	IC MC14495P
ICC2	8-759-938-68	s	IC CXD1095Q
ICC10	8-759-926-11	s	IC SN74HC138ANS
ICC11	8-759-239-55	s	IC TC74HC123AF
ICC12	8-759-239-55	s	IC TC74HC123AF
ICC13	8-759-908-35	s	IC TL7705CP-B
ICD7	8-759-153-05	s	IC UPD70325L-10
ICE1	8-759-926-07	s	IC SN74HC132ANS
ICF3	8-759-938-68	s	IC CXD1095Q
ICG6	8-759-388-20	o	IC 27C010-CPU94V3.00, EPROM
ICG8	8-759-388-21	o	IC PALCE16V8-DEC.V1.10, EEPD
ICG11	8-759-926-49	s	IC SN74HC245NS
ICH1	8-759-925-72	s	IC SN74HC02ANS
ICH2	8-759-239-55	s	IC TC74HC123AF
ICH3	8-759-925-74	s	IC TC74HC04ANS
ICH4	8-759-239-55	s	IC TC74HC123AF
ICH9	8-759-927-46	s	IC SN74HC00ANS
ICJ1	8-759-925-76	s	IC SN74HC08ANS
ICJ2	8-759-926-24	s	IC SN74HC164ANS
ICJ3	8-759-944-01	s	IC BA6212
ICJ8	8-759-977-94	s	IC MSM62X42BRS-A
ICJ9	8-759-925-90	s	IC SN74HC74ANS
ICJ11	8-759-926-77	s	IC SN74HC541ANS
ICK1	8-759-239-58	s	IC TC74HC221AF
ICK2	8-759-039-87	s	IC PEEL18CV8-SW.V1.0, PLD
ICK4	8-759-153-04	s	IC UPD72001C-11
ICK6	8-759-158-11	s	IC BQ4011YMA-100
ICK7	8-752-337-62	s	IC CXK58257ASP-10L
ICK8	8-759-926-11	s	IC SN74HC138ANS
ICK9	8-759-973-72	s	IC SN74LS07NS
ICK11	8-759-926-77	s	IC SN74HC541ANS
ICL3	8-759-729-77	s	IC GAL16V8-SIO.V1.0, EEPD
ICL8	8-759-926-11	s	IC SN74HC138ANS
ICL9	8-759-239-55	s	IC TC74HC123AF
ICM1	8-759-239-55	s	IC TC74HC123AF
ICM2	8-759-239-55	s	IC TC74HC123AF
ICM9	8-759-925-90	s	IC SN74HC74ANS
ICM11	8-759-926-77	s	IC SN74HC541ANS
ICN1	8-759-987-27	s	IC LM1881M
ICN6	8-759-926-30	s	IC AM26LS30PC
ICN7	8-759-178-93	s	IC AM26C32CN
ICN9	8-759-925-85	s	IC SN74HC32ANS
ICP9	8-759-926-77	s	IC SN74HC541ANS
ICR2	8-759-980-04	s	IC LM311PS
ICR3	8-759-980-04	s	IC LM311PS
ICR4	8-759-980-04	s	IC LM311PS
ICR5	8-759-980-04	s	IC LM311PS
ICR8	8-759-925-85	s	IC SN74HC32ANS
L1	1-412-525-31	s	INDUCTOR 10uH
ND1	8-719-901-68	s	LED GL-6R202, RED
Q1	8-729-119-77	s	TRANSISTOR 2SA1175-FEK
Q2	8-729-119-77	s	TRANSISTOR 2SA1175-FEK

NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

Ref. No. or Q'ty	Part No.	SP Description
Q3	8-729-119-77	s TRANSISTOR 2SA1175-FEK
Q4	8-729-119-77	s TRANSISTOR 2SA1175-FEK
Q5	8-729-119-77	s TRANSISTOR 2SA1175-FEK
Q6	8-729-119-77	s TRANSISTOR 2SA1175-FEK
Q7	8-729-119-77	s TRANSISTOR 2SA1175-FEK
Q8	8-729-119-77	s TRANSISTOR 2SA1175-FEK
Q9	8-729-119-77	s TRANSISTOR 2SA1175-FEK
Q10	8-729-119-77	s TRANSISTOR 2SA1175-FEK
Q11	8-729-119-77	s TRANSISTOR 2SA1175-FEK
Q12	8-729-119-78	s TRANSISTOR 2SC2785-HFE
R1	1-215-445-00	s METAL 10K 1% 1/6W
R2	1-215-485-00	s METAL 470K 1% 1/6W
R3	1-215-437-00	s METAL 4.7K 1% 1/6W
R4	1-215-445-00	s METAL 10K 1% 1/6W
R5	1-215-445-00	s METAL 10K 1% 1/6W
R6	1-215-489-00	s METAL 680K 1% 1/6W
R7	1-215-431-00	s METAL 2.7K 1% 1/6W
R8	1-215-394-00	s METAL 75 1% 1/6W
R9	1-215-393-00	s METAL 68 1% 1/6W
R10	1-215-423-00	s METAL 1.2K 1% 1/6W
R11	1-215-445-00	s METAL 10K 1% 1/6W
R12	1-215-485-00	s METAL 470K 1% 1/6W
R13	1-215-437-00	s METAL 4.7K 1% 1/6W
R14	1-215-445-00	s METAL 10K 1% 1/6W
R15	1-215-445-00	s METAL 10K 1% 1/6W
R16	1-215-489-00	s METAL 680K 1% 1/6W
R17	1-215-431-00	s METAL 2.7K 1% 1/6W
R18	1-215-394-00	s METAL 75 1% 1/6W
R19	1-215-393-00	s METAL 68 1% 1/6W
R20	1-215-423-00	s METAL 1.2K 1% 1/6W
R21	1-215-439-00	s METAL 5.6K 1% 1/6W
R22	1-215-439-00	s METAL 5.6K 1% 1/6W
R23	1-215-445-00	s METAL 10K 1% 1/6W
R24	1-215-485-00	s METAL 470K 1% 1/6W
R25	1-215-437-00	s METAL 4.7K 1% 1/6W
R26	1-215-445-00	s METAL 10K 1% 1/6W
R27	1-215-445-00	s METAL 10K 1% 1/6W
R28	1-215-489-00	s METAL 680K 1% 1/6W
R29	1-215-431-00	s METAL 2.7K 1% 1/6W
R30	1-215-394-00	s METAL 75 1% 1/6W
R31	1-215-393-00	s METAL 68 1% 1/6W
R32	1-215-423-00	s METAL 1.2K 1% 1/6W
R33	1-215-445-00	s METAL 10K 1% 1/6W
R34	1-215-485-00	s METAL 470K 1% 1/6W
R35	1-215-437-00	s METAL 4.7K 1% 1/6W
R36	1-215-445-00	s METAL 10K 1% 1/6W
R37	1-215-445-00	s METAL 10K 1% 1/6W
R38	1-215-489-00	s METAL 680K 1% 1/6W
R39	1-215-431-00	s METAL 2.7K 1% 1/6W
R40	1-215-394-00	s METAL 75 1% 1/6W
R41	1-215-393-00	s METAL 68 1% 1/6W
R42	1-215-423-00	s METAL 1.2K 1% 1/6W
R43	1-215-439-00	s METAL 5.6K 1% 1/6W
R44	1-215-439-00	s METAL 5.6K 1% 1/6W
R45	1-215-445-00	s METAL 10K 1% 1/6W
R46	1-215-445-00	s METAL 10K 1% 1/6W
R47	1-215-445-00	s METAL 10K 1% 1/6W
R48	1-215-445-00	s METAL 10K 1% 1/6W
R49	1-215-445-00	s METAL 10K 1% 1/6W

Ref. No. or Q'ty	Part No.	SP Description
R50	1-215-445-00	s METAL 10K 1% 1/6W
R51	1-215-421-00	s METAL 1K 1% 1/6W
R52	1-215-437-00	s METAL 4.7K 1% 1/6W
R53	1-215-477-00	s METAL 220K 1% 1/6W
R54	1-215-481-00	s METAL 330K 1% 1/6W
R55	1-215-477-00	s METAL 220K 1% 1/6W
R56	1-215-451-00	s METAL 18K 1% 1/6W
R57	1-215-385-00	s METAL 33 1% 1/6W
R58	1-215-489-00	s METAL 680K 1% 1/6W
R59	1-215-445-00	s METAL 10K 1% 1/6W
R60	1-215-457-00	s METAL 33K 1% 1/6W
R61	1-215-441-00	s METAL 6.8K 1% 1/6W
R62	1-215-428-00	s METAL 2K 1% 1/6W
R63	1-215-453-00	s METAL 22K 1% 1/6W
R64	1-215-421-00	s METAL 1K 1% 1/6W
R65	1-215-421-00	s METAL 1K 1% 1/6W
R66	1-215-445-00	s METAL 10K 1% 1/6W
R67	1-215-397-00	s METAL 100 1% 1/6W
R68	1-215-469-00	s METAL 100K 1% 1/6W
R69	1-215-469-00	s METAL 100K 1% 1/6W
R70	1-215-445-00	s METAL 10K 1% 1/6W
R71	1-215-461-00	s METAL 47K 1% 1/6W
R72	1-215-445-00	s METAL 10K 1% 1/6W
R73	1-215-445-00	s METAL 10K 1% 1/6W
R74	1-215-445-00	s METAL 10K 1% 1/6W
R75	1-215-445-00	s METAL 10K 1% 1/6W
R76	1-215-445-00	s METAL 10K 1% 1/6W
R77	1-215-445-00	s METAL 10K 1% 1/6W
R78	1-215-381-00	s METAL 22 1% 1/6W
R79	1-215-437-00	s METAL 4.7K 1% 1/6W
R80	1-215-421-00	s METAL 1K 1% 1/6W
R81	1-215-461-00	s METAL 47K 1% 1/6W
R82	1-215-445-00	s METAL 10K 1% 1/6W
R83	1-215-486-00	s METAL 510K 1% 1/6W
R84	1-215-445-00	s METAL 10K 1% 1/6W
R85	1-215-486-00	s METAL 510K 1% 1/6W
R86	1-215-486-00	s METAL 510K 1% 1/6W
R87	1-215-486-00	s METAL 510K 1% 1/6W
R88	1-215-486-00	s METAL 510K 1% 1/6W
R89	1-215-486-00	s METAL 510K 1% 1/6W
R90	1-215-469-00	s METAL 100K 1% 1/6W
R91	1-215-469-00	s METAL 100K 1% 1/6W
R92	1-215-437-00	s METAL 4.7K 1% 1/6W
R93	1-215-437-00	s METAL 4.7K 1% 1/6W
R94	1-215-445-00	s METAL 10K 1% 1/6W
R95	1-215-405-00	s METAL 220 1% 1/6W
R96	1-215-405-00	s METAL 220 1% 1/6W
R97	1-215-453-00	s METAL 22K 1% 1/6W
R98	1-215-433-00	s METAL 3.3K 1% 1/6W
R99	1-215-437-00	s METAL 4.7K 1% 1/6W
R100	1-215-461-00	s METAL 47K 1% 1/6W
R101	1-215-436-00	s METAL 4.3K 1% 1/6W
R102	1-215-461-00	s METAL 47K 1% 1/6W
R103	1-215-461-00	s METAL 47K 1% 1/6W
R104	1-215-461-00	s METAL 47K 1% 1/6W
R105	1-215-437-00	s METAL 4.7K 1% 1/6W
R107	1-215-437-00	s METAL 4.7K 1% 1/6W
R109	1-215-445-00	s METAL 10K 1% 1/6W
R110	1-215-445-00	s METAL 10K 1% 1/6W

NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

(CPU-94 BOARD(BVS-A3232/BKDS-RS1690))

Ref. No. or Q'ty	Part No.	SP Description
R112	1-215-439-00	s METAL 5.6K 1% 1/6W
R113	1-215-461-00	s METAL 47K 1% 1/6W
R114	1-215-445-00	s METAL 10K 1% 1/6W
R115	1-215-425-00	s METAL 1.5K 1% 1/6W
R116	1-215-445-00	s METAL 10K 1% 1/6W
R126	1-215-445-00	s METAL 10K 1% 1/6W
R127	1-215-453-00	s METAL 22K 1% 1/6W
R300	1-215-485-00	s METAL 470K 1% 1/6W
R301	1-215-445-00	s METAL 10K 1% 1/6W
R538	1-215-451-00	s METAL 18K 1% 1/6W
RB1	1-235-005-00	s RESISTOR BLOCK 47Kx8
RB2	1-235-005-00	s RESISTOR BLOCK 47Kx8
RB3	1-235-005-00	s RESISTOR BLOCK 47Kx8
RB4	1-235-005-00	s RESISTOR BLOCK 47Kx8
RB5	1-231-401-00	s RESISTOR BLOCK 470x8
RB6	1-231-405-00	s RESISTOR BLOCK 1Kx8
RB7	1-231-410-00	s RESISTOR BLOCK 10Kx8
RB8	1-235-005-00	s RESISTOR BLOCK 47Kx8
RB9	1-231-410-00	s RESISTOR BLOCK 10Kx8
RB11	1-231-411-00	s RESISTOR BLOCK 100Kx8
RB12	1-235-005-00	s RESISTOR BLOCK 47Kx8
RB14	1-235-005-00	s RESISTOR BLOCK 47Kx8
RB16	1-235-005-00	s RESISTOR BLOCK 47Kx8
RB17	1-231-410-00	s RESISTOR BLOCK 10Kx8
RB18	1-231-410-00	s RESISTOR BLOCK 10Kx8
RB19	1-231-410-00	s RESISTOR BLOCK 10Kx8
RB20	1-231-549-11	s RESISTOR BLOCK 47KX4
RB21	1-231-549-11	s RESISTOR BLOCK 47KX4
RB300	1-231-533-00	s RESISTOR BLOCK 10Kx4
RB301	1-235-005-00	s RESISTOR BLOCK 47Kx8
RB302	1-235-005-00	s RESISTOR BLOCK 47Kx8
RV2	1-237-519-21	s RES, ADJ METAL 20K
RV3	1-237-519-21	s RES, ADJ METAL 20K
RY1	1-515-647-11	s RELAY
RY2	1-515-647-11	s RELAY
S1	1-553-572-00	s SWITCH, DIP 4-CKT
S2	1-554-303-21	s SWITCH, TACTILE
S3	1-554-303-21	s SWITCH, TACTILE
S4	1-553-925-00	s SWITCH, DIGITAL
S5	1-571-967-11	s SWITCH, DIP 8-CKT
S6	1-571-967-11	s SWITCH, DIP 8-CKT
S7	1-554-027-00	s SWITCH, DIGITAL
S8	1-570-623-11	s SWITCH, DIP 8-CKT
X1	1-567-928-11	s VIBLATOR, CERAMIC 20.00MHz
X2	1-579-694-11	s RESONATOR, CERAMIC 4.915MHz

DP-251 BOARD(BVS-A3232/BKDS-PA3291)

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-661-803-11	o PRINTED CIRCUIT BOARD, DP-251
CN11	1-564-013-11	o CONNECTOR 3P, MALE
D501	8-719-036-60	s LED L501B-SRG-P, RED/GRN

DUS-971 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-661-811-11	o PRINTED CIRCUIT BOARD, DUS-971
CN1	1-506-702-11	o CONNECTOR, ILG 3P, MALE
CN2	1-560-365-00	o CONNECTOR, ILG 3P, MALE

FL-235 BOARD(BVS-A3232/BKDS-PA3291)

Ref. No. or Q'ty	Part No.	SP Description
1pc	1-661-804-11	o PRINTED CIRCUIT BOARD, FL-235
C1	△ 1-115-166-11	s FILM 0.22uF 20% 275V
C2	△ 1-115-163-11	s FILM 0.022uF 20% 275V
C3	△ 1-113-937-11	s CERAMIC 0.0022uF 125V
C4	△ 1-113-937-11	s CERAMIC 0.0022uF 125V
CN1	△ 1-564-321-00	s CONNECTOR, VH 2P, MALE
CN2	△ 1-564-687-11	o CONNECTOR, VH 3P, MALE
LF1	△ 1-421-944-11	s TRANSFORMER, LINE FILTER
R1	△ 1-214-937-00	s METAL 1M 1% 1/2W

NOTE : Please see page 5-8 for the parts that are not listed
in the parts list.

HN-237 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C3	1-107-890-11	s ELECT 2200uF 20% 25V
C4	1-107-890-11	s ELECT 2200uF 20% 25V
CN1	1-568-144-11	o CONNECTOR, DIN 96P, MALE
CN2	1-568-144-11	o CONNECTOR, DIN 96P, MALE
COP1	1-562-579-21	s PLUG, SHORTING
COP2	1-562-579-21	s PLUG, SHORTING
COP3	1-562-579-21	s PLUG, SHORTING
COP4	1-562-579-21	s PLUG, SHORTING
COP5	1-562-579-21	s PLUG, SHORTING
COP6	1-562-579-21	s PLUG, SHORTING
COP7	1-562-579-21	s PLUG, SHORTING
COP8	1-562-579-21	s PLUG, SHORTING
COP9	1-562-579-21	s PLUG, SHORTING
COP10	1-562-579-21	s PLUG, SHORTING
COP11	1-562-579-21	s PLUG, SHORTING
COP12	1-562-579-21	s PLUG, SHORTING
COP13	1-562-579-21	s PLUG, SHORTING
COP14	1-562-579-21	s PLUG, SHORTING
COP15	1-562-579-21	s PLUG, SHORTING
COP16	1-562-579-21	s PLUG, SHORTING
COR1	1-564-948-21	o PIN, SHORTING
COR2	1-564-948-21	o PIN, SHORTING
COR3	1-564-948-21	o PIN, SHORTING
COR4	1-564-948-21	o PIN, SHORTING
COR5	1-564-948-21	o PIN, SHORTING
COR6	1-564-948-21	o PIN, SHORTING
COR7	1-564-948-21	o PIN, SHORTING
COR8	1-564-948-21	o PIN, SHORTING
COR9	1-564-948-21	o PIN, SHORTING
COR10	1-564-948-21	o PIN, SHORTING
COR11	1-564-948-21	o PIN, SHORTING
COR12	1-564-948-21	o PIN, SHORTING
COR13	1-564-948-21	o PIN, SHORTING
COR14	1-564-948-21	o PIN, SHORTING
COR15	1-564-948-21	o PIN, SHORTING
COR16	1-564-948-21	o PIN, SHORTING
R1	1-215-408-00	s METAL 300 1% 1/6W
R2	1-215-375-00	s METAL 12 1% 1/6W
R3	1-215-408-00	s METAL 300 1% 1/6W
R4	1-215-408-00	s METAL 300 1% 1/6W
R5	1-215-375-00	s METAL 12 1% 1/6W
R6	1-215-408-00	s METAL 300 1% 1/6W
R7	1-215-408-00	s METAL 300 1% 1/6W
R8	1-215-375-00	s METAL 12 1% 1/6W
R9	1-215-408-00	s METAL 300 1% 1/6W
R10	1-215-408-00	s METAL 300 1% 1/6W
R11	1-215-375-00	s METAL 12 1% 1/6W
R12	1-215-408-00	s METAL 300 1% 1/6W
R13	1-215-408-00	s METAL 300 1% 1/6W
R14	1-215-375-00	s METAL 12 1% 1/6W
R15	1-215-408-00	s METAL 300 1% 1/6W
R16	1-215-408-00	s METAL 300 1% 1/6W
R17	1-215-375-00	s METAL 12 1% 1/6W
R18	1-215-408-00	s METAL 300 1% 1/6W
R19	1-215-408-00	s METAL 300 1% 1/6W
R20	1-215-375-00	s METAL 12 1% 1/6W

(HN-237 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R21	1-215-408-00	s METAL 300 1% 1/6W
R22	1-215-408-00	s METAL 300 1% 1/6W
R23	1-215-375-00	s METAL 12 1% 1/6W
R24	1-215-408-00	s METAL 300 1% 1/6W
R25	1-215-408-00	s METAL 300 1% 1/6W
R26	1-215-375-00	s METAL 12 1% 1/6W
R27	1-215-408-00	s METAL 300 1% 1/6W
R28	1-215-408-00	s METAL 300 1% 1/6W
R29	1-215-375-00	s METAL 12 1% 1/6W
R30	1-215-408-00	s METAL 300 1% 1/6W
R31	1-215-408-00	s METAL 300 1% 1/6W
R32	1-215-375-00	s METAL 12 1% 1/6W
R33	1-215-408-00	s METAL 300 1% 1/6W
R34	1-215-408-00	s METAL 300 1% 1/6W
R35	1-215-375-00	s METAL 12 1% 1/6W
R36	1-215-408-00	s METAL 300 1% 1/6W
R37	1-215-408-00	s METAL 300 1% 1/6W
R38	1-215-375-00	s METAL 12 1% 1/6W
R39	1-215-408-00	s METAL 300 1% 1/6W
R40	1-215-408-00	s METAL 300 1% 1/6W
R41	1-215-375-00	s METAL 12 1% 1/6W
R42	1-215-408-00	s METAL 300 1% 1/6W
R43	1-215-408-00	s METAL 300 1% 1/6W
R44	1-215-375-00	s METAL 12 1% 1/6W
R45	1-215-408-00	s METAL 300 1% 1/6W
R46	1-215-408-00	s METAL 300 1% 1/6W
R47	1-215-375-00	s METAL 12 1% 1/6W
R48	1-215-408-00	s METAL 300 1% 1/6W



NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

HN-238 BOARD

Ref. No. or Q'ty	Part No.	SP Description
C3	1-107-890-11	s ELECT 2200uF 20% 25V
C4	1-107-890-11	s ELECT 2200uF 20% 25V
CN1	1-568-144-11	o CONNECTOR, DIN 96P, MALE
CN2	1-568-144-11	o CONNECTOR, DIN 96P, MALE
COP1	1-562-579-21	s PLUG, SHORTING
COP2	1-562-579-21	s PLUG, SHORTING
COP3	1-562-579-21	s PLUG, SHORTING
COP4	1-562-579-21	s PLUG, SHORTING
COP5	1-562-579-21	s PLUG, SHORTING
COP6	1-562-579-21	s PLUG, SHORTING
COP7	1-562-579-21	s PLUG, SHORTING
COP8	1-562-579-21	s PLUG, SHORTING
COP9	1-562-579-21	s PLUG, SHORTING
COP10	1-562-579-21	s PLUG, SHORTING
COP11	1-562-579-21	s PLUG, SHORTING
COP12	1-562-579-21	s PLUG, SHORTING
COP13	1-562-579-21	s PLUG, SHORTING
COP14	1-562-579-21	s PLUG, SHORTING
COP15	1-562-579-21	s PLUG, SHORTING
COP16	1-562-579-21	s PLUG, SHORTING
COR1	1-564-948-21	o PIN, SHORTING
COR2	1-564-948-21	o PIN, SHORTING
COR3	1-564-948-21	o PIN, SHORTING
COR4	1-564-948-21	o PIN, SHORTING
COR5	1-564-948-21	o PIN, SHORTING
COR6	1-564-948-21	o PIN, SHORTING
COR7	1-564-948-21	o PIN, SHORTING
COR8	1-564-948-21	o PIN, SHORTING
COR9	1-564-948-21	o PIN, SHORTING
COR10	1-564-948-21	o PIN, SHORTING
COR11	1-564-948-21	o PIN, SHORTING
COR12	1-564-948-21	o PIN, SHORTING
COR13	1-564-948-21	o PIN, SHORTING
COR14	1-564-948-21	o PIN, SHORTING
COR15	1-564-948-21	o PIN, SHORTING
COR16	1-564-948-21	o PIN, SHORTING
R1	1-215-408-00	s METAL 300 1% 1/6W
R2	1-215-375-00	s METAL 12 1% 1/6W
R3	1-215-408-00	s METAL 300 1% 1/6W
R4	1-215-408-00	s METAL 300 1% 1/6W
R5	1-215-375-00	s METAL 12 1% 1/6W
R6	1-215-408-00	s METAL 300 1% 1/6W
R7	1-215-408-00	s METAL 300 1% 1/6W
R8	1-215-375-00	s METAL 12 1% 1/6W
R9	1-215-408-00	s METAL 300 1% 1/6W
R10	1-215-408-00	s METAL 300 1% 1/6W
R11	1-215-375-00	s METAL 12 1% 1/6W
R12	1-215-408-00	s METAL 300 1% 1/6W
R13	1-215-408-00	s METAL 300 1% 1/6W
R14	1-215-375-00	s METAL 12 1% 1/6W
R15	1-215-408-00	s METAL 300 1% 1/6W
R16	1-215-408-00	s METAL 300 1% 1/6W
R17	1-215-375-00	s METAL 12 1% 1/6W
R18	1-215-408-00	s METAL 300 1% 1/6W
R19	1-215-408-00	s METAL 300 1% 1/6W
R20	1-215-375-00	s METAL 12 1% 1/6W

(HN-238 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R21	1-215-408-00	s METAL 300 1% 1/6W
R22	1-215-408-00	s METAL 300 1% 1/6W
R23	1-215-375-00	s METAL 12 1% 1/6W
R24	1-215-408-00	s METAL 300 1% 1/6W
R25	1-215-408-00	s METAL 300 1% 1/6W
R26	1-215-375-00	s METAL 12 1% 1/6W
R27	1-215-408-00	s METAL 300 1% 1/6W
R28	1-215-408-00	s METAL 300 1% 1/6W
R29	1-215-375-00	s METAL 12 1% 1/6W
R30	1-215-408-00	s METAL 300 1% 1/6W
R31	1-215-408-00	s METAL 300 1% 1/6W
R32	1-215-375-00	s METAL 12 1% 1/6W
R33	1-215-408-00	s METAL 300 1% 1/6W
R34	1-215-408-00	s METAL 300 1% 1/6W
R35	1-215-375-00	s METAL 12 1% 1/6W
R36	1-215-408-00	s METAL 300 1% 1/6W
R37	1-215-408-00	s METAL 300 1% 1/6W
R38	1-215-375-00	s METAL 12 1% 1/6W
R39	1-215-408-00	s METAL 300 1% 1/6W
R40	1-215-408-00	s METAL 300 1% 1/6W
R41	1-215-375-00	s METAL 12 1% 1/6W
R42	1-215-408-00	s METAL 300 1% 1/6W
R43	1-215-408-00	s METAL 300 1% 1/6W
R44	1-215-375-00	s METAL 12 1% 1/6W
R45	1-215-408-00	s METAL 300 1% 1/6W
R46	1-215-408-00	s METAL 300 1% 1/6W
R47	1-215-375-00	s METAL 12 1% 1/6W
R48	1-215-408-00	s METAL 300 1% 1/6W

NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

IPM-80 BOARD

Ref. No. or Q'ty	Part No.	SP Description
16pcs	A-8277-579-A	o MOUNTED CIRCUIT BOARD, IPM-80
C1	1-163-235-11	s CERAMIC, CHIP 22PF 5% 50V
C2	1-163-038-91	s CERAMIC 0.1uF 25V
C3	1-163-235-11	s CERAMIC, CHIP 22PF 5% 50V
C4	1-163-235-11	s CERAMIC, CHIP 22PF 5% 50V
C5	1-163-038-91	s CERAMIC 0.1uF 25V
C6	1-163-235-11	s CERAMIC, CHIP 22PF 5% 50V
CN1	1-566-098-11	o CONNECTOR, BB 14P, MALE
R1	1-208-810-11	s METAL, CHIP 15K 0.5% 1/10W
R2	1-208-803-11	s METAL, CHIP 7.5K 0.5% 1/10W
R3	1-208-810-11	s METAL, CHIP 15K 0.5% 1/10W
R4	1-208-803-11	s METAL, CHIP 7.5K 0.5% 1/10W
R5	1-208-810-11	s METAL, CHIP 15K 0.5% 1/10W
R6	1-208-803-11	s METAL, CHIP 7.5K 0.5% 1/10W
R7	1-208-810-11	s METAL, CHIP 15K 0.5% 1/10W
R8	1-208-803-11	s METAL, CHIP 7.5K 0.5% 1/10W

MB-721 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8277-574-A	o MOUNTED CIRCUIT BOARD, MB-721
C1	1-107-890-11	s ELECT 220uF 20% 25V
CN1	1-564-674-11	o CONNECTOR, 8P, MALE
CN2	1-564-674-11	o CONNECTOR, 8P, MALE

MX-82 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8277-577-A	o PRINTED CIRCUIT BOARD, MX-82
The MX-82 board includes the IPM-80 board and the OPM-24 board. As for the parts on the IPM-80 board and the OPM-24 board, refer to the parts list of each board.		
2pcs	3-166-184-01	o LEVER, PC BOARD
1pc	3-174-853-01	o PLATE, SHIELD
2pcs	7-626-320-11	s PIN, SPRING 3X8
6pcs	7-682-903-11	s SCREW +PWH 3X6
C1	1-104-666-11	s ELECT 220uF 20% 25V
C2	1-104-666-11	s ELECT 220uF 20% 25V
C3	1-104-666-11	s ELECT 220uF 20% 25V
C7	1-126-967-11	s ELECT 47uF 20% 10V
CN1	1-568-144-11	o CONNECTOR, DIN 96P, MALE
CN2	1-568-144-11	o CONNECTOR, DIN 96P, MALE
CN3	1-569-465-11	o CONNECTOR, DIN 48P, MALE
COR1	1-564-948-21	o PIN, SHORTING
COR2	1-564-948-21	o PIN, SHORTING
COR3	1-564-948-21	o PIN, SHORTING
COR4	1-564-948-21	o PIN, SHORTING
COR5	1-564-948-21	o PIN, SHORTING
COR6	1-564-948-21	o PIN, SHORTING
COR7	1-564-948-21	o PIN, SHORTING
COR8	1-564-948-21	o PIN, SHORTING
COR9	1-564-948-21	o PIN, SHORTING
COR10	1-564-948-21	o PIN, SHORTING
COR11	1-564-948-21	o PIN, SHORTING
COR12	1-564-948-21	o PIN, SHORTING
COR13	1-564-948-21	o PIN, SHORTING
COR14	1-564-948-21	o PIN, SHORTING
COR15	1-564-948-21	o PIN, SHORTING
COR16	1-564-948-21	o PIN, SHORTING
COR17	1-564-948-21	o PIN, SHORTING
COR18	1-564-948-21	o PIN, SHORTING
COR19	1-564-948-21	o PIN, SHORTING
COR20	1-564-948-21	o PIN, SHORTING
COR21	1-564-948-21	o PIN, SHORTING
COR22	1-564-948-21	o PIN, SHORTING
COR23	1-564-948-21	o PIN, SHORTING
COR24	1-564-948-21	o PIN, SHORTING
COR25	1-564-948-21	o PIN, SHORTING
COR26	1-564-948-21	o PIN, SHORTING
COR27	1-564-948-21	o PIN, SHORTING
COR28	1-564-948-21	o PIN, SHORTING
COR29	1-564-948-21	o PIN, SHORTING
COR30	1-564-948-21	o PIN, SHORTING
COR31	1-564-948-21	o PIN, SHORTING
COR32	1-564-948-21	o PIN, SHORTING
D1	8-719-911-19	s DIODE 1SS119
D2	8-719-911-19	s DIODE 1SS119
E1	3-673-772-01	s TERMINAL, TP
E2	3-673-772-01	s TERMINAL, TP
E3	3-673-772-01	s TERMINAL, TP
E4	3-673-772-01	s TERMINAL, TP
FL1	1-421-773-11	s FILTER, NOISE
FL2	1-421-773-11	s FILTER, NOISE

NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

(MX-82 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
FL3	1-421-773-11	s	FILTER, NOISE
IC1	8-759-926-49	s	IC SN74HC245NS
IC1	8-759-745-61	s	IC NJM4560D-D
IC1	8-759-900-72	s	IC NE5532P
IC2	8-759-926-77	s	IC SN74HC541ANS
IC3	8-759-926-77	s	IC SN74HC541ANS
IC4	8-759-004-91	s	IC MC74HC688N
IC5	8-759-926-77	s	IC SN74HC541ANS
IC6	8-759-006-95	s	IC MC74HC154N
IC7	8-759-925-90	s	IC SN74HC74ANS
IC8	8-759-925-74	s	IC TC74HC04ANS
IC10	8-759-999-83	s	IC DG408DJ
IC11	8-759-999-83	s	IC DG408DJ
IC12	8-759-999-83	s	IC DG408DJ
IC13	8-759-999-83	s	IC DG408DJ
IC14	8-759-999-83	s	IC DG408DJ
IC15	8-759-999-83	s	IC DG408DJ
IC16	8-759-999-83	s	IC DG408DJ
IC17	8-759-999-83	s	IC DG408DJ
IC18	8-759-999-83	s	IC DG408DJ
IC19	8-759-999-83	s	IC DG408DJ
IC20	8-759-999-83	s	IC DG408DJ
IC21	8-759-999-83	s	IC DG408DJ
IC22	8-759-999-83	s	IC DG408DJ
IC23	8-759-999-83	s	IC DG408DJ
IC24	8-759-999-83	s	IC DG408DJ
IC25	8-759-999-83	s	IC DG408DJ
IC26	8-759-999-83	s	IC DG408DJ
IC27	8-759-999-83	s	IC DG408DJ
IC28	8-759-999-83	s	IC DG408DJ
IC29	8-759-999-83	s	IC DG408DJ
IC30	8-759-999-83	s	IC DG408DJ
IC31	8-759-999-83	s	IC DG408DJ
IC32	8-759-999-83	s	IC DG408DJ
IC33	8-759-999-83	s	IC DG408DJ
IC34	8-759-999-83	s	IC DG408DJ
IC35	8-759-999-83	s	IC DG408DJ
IC36	8-759-999-83	s	IC DG408DJ
IC37	8-759-999-83	s	IC DG408DJ
IC38	8-759-999-83	s	IC DG408DJ
IC39	8-759-999-83	s	IC DG408DJ
IC40	8-759-999-83	s	IC DG408DJ
IC41	8-759-999-83	s	IC DG408DJ
IC50	8-759-999-83	s	IC DG408DJ
IC51	8-759-999-83	s	IC DG408DJ
IC52	8-759-999-83	s	IC DG408DJ
IC53	8-759-999-83	s	IC DG408DJ
IC54	8-759-999-83	s	IC DG408DJ
IC55	8-759-999-83	s	IC DG408DJ
IC56	8-759-999-83	s	IC DG408DJ
IC57	8-759-999-83	s	IC DG408DJ
IC58	8-759-999-83	s	IC DG408DJ
IC59	8-759-999-83	s	IC DG408DJ
IC60	8-759-999-83	s	IC DG408DJ
IC61	8-759-999-83	s	IC DG408DJ
IC62	8-759-999-83	s	IC DG408DJ
IC63	8-759-999-83	s	IC DG408DJ
IC64	8-759-999-83	s	IC DG408DJ

(MX-82 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
IC65	8-759-999-83	s	IC DG408DJ
IC66	8-759-999-83	s	IC DG408DJ
IC67	8-759-999-83	s	IC DG408DJ
IC68	8-759-999-83	s	IC DG408DJ
IC69	8-759-999-83	s	IC DG408DJ
IC70	8-759-999-83	s	IC DG408DJ
IC71	8-759-999-83	s	IC DG408DJ
IC72	8-759-999-83	s	IC DG408DJ
IC73	8-759-999-83	s	IC DG408DJ
IC74	8-759-999-83	s	IC DG408DJ
IC75	8-759-999-83	s	IC DG408DJ
IC76	8-759-999-83	s	IC DG408DJ
IC77	8-759-999-83	s	IC DG408DJ
IC78	8-759-999-83	s	IC DG408DJ
IC79	8-759-999-83	s	IC DG408DJ
IC80	8-759-999-83	s	IC DG408DJ
IC81	8-759-999-83	s	IC DG408DJ
IC90	8-759-926-28	s	IC SN74HC174ANS
IC91	8-759-926-80	s	IC SN74HC573BNS
IC92	8-759-009-57	s	IC MC14555BFEL
IC93	8-759-926-28	s	IC SN74HC174ANS
IC94	8-759-926-80	s	IC SN74HC573BNS
IC95	8-759-926-28	s	IC SN74HC174ANS
IC96	8-759-926-80	s	IC SN74HC573BNS
IC97	8-759-009-57	s	IC MC14555BFEL
IC98	8-759-926-28	s	IC SN74HC174ANS
IC99	8-759-926-80	s	IC SN74HC573BNS
IC100	8-759-926-28	s	IC SN74HC174ANS
IC101	8-759-926-80	s	IC SN74HC573BNS
IC102	8-759-009-57	s	IC MC14555BFEL
IC103	8-759-926-28	s	IC SN74HC174ANS
IC104	8-759-926-80	s	IC SN74HC573BNS
IC105	8-759-926-28	s	IC SN74HC174ANS
IC106	8-759-926-80	s	IC SN74HC573BNS
IC107	8-759-009-57	s	IC MC14555BFEL
IC108	8-759-926-28	s	IC SN74HC174ANS
IC109	8-759-926-80	s	IC SN74HC573BNS
IC110	8-759-926-28	s	IC SN74HC174ANS
IC111	8-759-926-80	s	IC SN74HC573BNS
IC112	8-759-009-57	s	IC MC14555BFEL
IC113	8-759-926-28	s	IC SN74HC174ANS
IC114	8-759-926-80	s	IC SN74HC573BNS
IC115	8-759-926-28	s	IC SN74HC174ANS
IC116	8-759-926-80	s	IC SN74HC573BNS
IC117	8-759-009-57	s	IC MC14555BFEL
IC118	8-759-926-28	s	IC SN74HC174ANS
IC119	8-759-926-80	s	IC SN74HC573BNS
IC120	8-759-926-28	s	IC SN74HC174ANS
IC121	8-759-926-80	s	IC SN74HC573BNS
IC122	8-759-009-57	s	IC MC14555BFEL
IC123	8-759-926-28	s	IC SN74HC174ANS
IC124	8-759-926-80	s	IC SN74HC573BNS
IC125	8-759-926-28	s	IC SN74HC174ANS
IC126	8-759-926-80	s	IC SN74HC573BNS
IC127	8-759-009-57	s	IC MC14555BFEL
IC128	8-759-926-28	s	IC SN74HC174ANS
IC129	8-759-926-80	s	IC SN74HC573BNS
IC130	8-759-239-23	s	IC TC74HC86AF
IC134	8-759-925-76	s	IC SN74HC08ANS

NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

(MX-82 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
R1	1-215-469-00	s METAL 100K 1% 1/6W
R2	1-215-469-00	s METAL 100K 1% 1/6W
R3	1-215-469-00	s METAL 100K 1% 1/6W
R4	1-215-469-00	s METAL 100K 1% 1/6W
R5	1-215-469-00	s METAL 100K 1% 1/6W
R16	1-215-437-00	s METAL 4.7K 1% 1/6W
R17	1-215-437-00	s METAL 4.7K 1% 1/6W
R24	1-215-437-00	s METAL 4.7K 1% 1/6W
R25	1-215-437-00	s METAL 4.7K 1% 1/6W
R32	1-215-437-00	s METAL 4.7K 1% 1/6W
R33	1-215-437-00	s METAL 4.7K 1% 1/6W
R40	1-215-437-00	s METAL 4.7K 1% 1/6W
R41	1-215-437-00	s METAL 4.7K 1% 1/6W
R48	1-215-437-00	s METAL 4.7K 1% 1/6W
R49	1-215-437-00	s METAL 4.7K 1% 1/6W
R56	1-215-437-00	s METAL 4.7K 1% 1/6W
R57	1-215-437-00	s METAL 4.7K 1% 1/6W
R64	1-215-437-00	s METAL 4.7K 1% 1/6W
R65	1-215-437-00	s METAL 4.7K 1% 1/6W
R72	1-215-437-00	s METAL 4.7K 1% 1/6W
R73	1-215-437-00	s METAL 4.7K 1% 1/6W
R80	1-215-437-00	s METAL 4.7K 1% 1/6W
R81	1-215-437-00	s METAL 4.7K 1% 1/6W
R88	1-215-437-00	s METAL 4.7K 1% 1/6W
R89	1-215-437-00	s METAL 4.7K 1% 1/6W
R96	1-215-437-00	s METAL 4.7K 1% 1/6W
R97	1-215-437-00	s METAL 4.7K 1% 1/6W
R104	1-215-437-00	s METAL 4.7K 1% 1/6W
R105	1-215-437-00	s METAL 4.7K 1% 1/6W
R112	1-215-437-00	s METAL 4.7K 1% 1/6W
R113	1-215-437-00	s METAL 4.7K 1% 1/6W
R120	1-215-437-00	s METAL 4.7K 1% 1/6W
R121	1-215-437-00	s METAL 4.7K 1% 1/6W
R128	1-215-437-00	s METAL 4.7K 1% 1/6W
R129	1-215-437-00	s METAL 4.7K 1% 1/6W
R136	1-215-437-00	s METAL 4.7K 1% 1/6W
R137	1-215-437-00	s METAL 4.7K 1% 1/6W
R138	1-215-469-00	s METAL 100K 1% 1/6W
R139	1-215-469-00	s METAL 100K 1% 1/6W
R140	1-215-469-00	s METAL 100K 1% 1/6W
R141	1-215-469-00	s METAL 100K 1% 1/6W
RB1	1-235-196-00	s RESISTOR BLOCK 100kx8
RB2	1-235-192-00	s RESISTOR BLOCK 1KX8
RB3	1-235-196-00	s RESISTOR BLOCK 100kx8
RB4	1-235-196-00	s RESISTOR BLOCK 100kx8
TP1	3-673-772-21	s TERMINAL, TP
TP2	3-673-772-21	s TERMINAL, TP
TP3	3-673-772-21	s TERMINAL, TP
TP4	3-673-772-21	s TERMINAL, TP
TP5	3-673-772-21	s TERMINAL, TP
TP6	3-673-772-21	s TERMINAL, TP
TP7	3-673-772-21	s TERMINAL, TP
TP8	3-673-772-21	s TERMINAL, TP
TP9	3-673-772-21	s TERMINAL, TP
TP10	3-673-772-21	s TERMINAL, TP
TP11	3-673-772-21	s TERMINAL, TP
TP12	3-673-772-21	s TERMINAL, TP
TP13	3-673-772-21	s TERMINAL, TP

(MX-82 BOARD)

Ref. No. or Q'ty	Part No.	SP Description
TP14	3-673-772-21	s TERMINAL, TP
TP15	3-673-772-21	s TERMINAL, TP
TP16	3-673-772-21	s TERMINAL, TP
TP17	3-673-772-21	s TERMINAL, TP
TP18	3-673-772-21	s TERMINAL, TP
TP19	3-673-772-21	s TERMINAL, TP
TP20	3-673-772-21	s TERMINAL, TP
TP21	3-673-772-21	s TERMINAL, TP
TP22	3-673-772-21	s TERMINAL, TP

OPM-24 BOARD		

Ref. No. or Q'ty	Part No.	SP Description
16pcs	A-8277-580-A	o MOUNTED CIRCUIT BOARD, OPM-24
C1	1-163-251-11	s CERAMIC, CHIP 100PF 5% 50V
C2	1-163-038-91	s CERAMIC 0.1uF 25V
C3	1-163-038-91	s CERAMIC 0.1uF 25V
CN1	1-566-096-11	s CONNECTOR, BB12P, MALE
R1	1-216-639-11	s METAL, CHIP 330 0.5% 1/10W
R2	1-216-673-11	s METAL, CHIP 8.2K 0.5% 1/10W
R3	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
R4	1-215-393-00	s METAL 68 1% 1/6W
R5	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R6	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R7	1-216-663-11	s METAL, CHIP 3.3K 0.5% 1/10W
R8	1-215-393-00	s METAL 68 1% 1/6W
R9	1-216-651-11	s METAL, CHIP 1K 0.5% 1/10W
R10	1-216-603-11	s METAL, CHIP 10 0.5% 1/10W
RV1	1-228-474-00	s RES, ADJ METAL 10K

NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

PS-453 BOARD(BVS-A3232/BKDS-PA3291)

Ref. No. or Q'ty	Part No.	SP	Description
3pcs	7-682-547-04	s	SCREW +B 3X6
2pcs	7-682-947-01	s	SCREW +PSW 3X6
C6	1-124-242-00	s	ELECT 33uF 20% 25V
C8	1-124-242-00	s	ELECT 33uF 20% 25V
C10	1-124-242-00	s	ELECT 33uF 20% 25V
CN3	1-564-215-11	o	CONNECTOR 4P, MALE
CN4	1-564-607-11	o	CONNECTOR, VH 6P, MALE
CN5	1-560-365-00	o	CONNECTOR, ILG 3P, MALE
CN6	1-566-314-11	o	CONNECTOR, B4P-VH 10P, MALE
CN8	1-564-215-11	o	CONNECTOR 4P, MALE
CN9	1-560-366-00	o	CONNECTOR, ILG 4P, MALE
CN10	1-564-013-11	o	CONNECTOR 3P, MALE
D1	8-719-988-30	s	DIODE D30SC4M
D2	8-719-988-30	s	DIODE D30SC4M
D3	8-719-988-30	s	DIODE D30SC4M
IC1	8-759-103-19	s	IC UPC319C
Q1	8-729-206-19	s	TRANSISTOR RN1201
Q2	8-729-206-19	s	TRANSISTOR RN1201
Q3	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q4	8-729-119-78	s	TRANSISTOR 2SC2785-HFE
Q5	8-729-119-77	s	TRANSISTOR 2SA1175-FEK
R2	1-249-427-11	s	CARBON 6.8K 5% 1/4W
R3	1-249-427-11	s	CARBON 6.8K 5% 1/4W
R4	1-249-427-11	s	CARBON 6.8K 5% 1/4W
R5	1-249-438-11	s	CARBON 56K 5% 1/4W
R6	1-249-427-11	s	CARBON 6.8K 5% 1/4W
R7	1-249-427-11	s	CARBON 6.8K 5% 1/4W
R8	1-249-438-11	s	CARBON 56K 5% 1/4W
R9	1-247-843-11	s	CARBON 3.3K 5% 1/4W
R10	1-247-843-11	s	CARBON 3.3K 5% 1/4W
R11	1-249-427-11	s	CARBON 6.8K 5% 1/4W
R12	1-247-839-11	s	CARBON 2.2K 5% 1/4W
R13	1-247-855-11	s	CARBON 10K 5% 1/4W
R14	1-247-839-11	s	CARBON 2.2K 5% 1/4W
R15	1-247-839-11	s	CARBON 2.2K 5% 1/4W
R17	1-247-839-11	s	CARBON 2.2K 5% 1/4W
R18	1-247-807-11	s	CARBON 100 5% 1/4W
R19	1-249-399-11	s	CARBON 33 5% 1/4W
R20	1-249-399-11	s	CARBON 33 5% 1/4W
R21	1-247-855-11	s	CARBON 10K 5% 1/4W
R22	1-247-855-11	s	CARBON 10K 5% 1/4W
R23	1-247-843-11	s	CARBON 3.3K 5% 1/4W
R24	1-249-428-11	s	CARBON 8.2K 5% 1/4W

FRAME

Ref. No. or Q'ty	Part No.	SP	Description
1pc	Δ 1-413-950-11	s	REGULATOR, SWITCHING
1pc	Δ 1-468-144-11	s	REGULATOR, SWITCHING
8pcs	Δ 1-535-321-11	o	TERMINAL, SOLDERLESS Included in the following Harnesses Harness (-15V) Harness (AC-A) Harness (SW-A)
5pcs	1-568-812-11	s	CONNECTOR, BNC
1pc	Δ 1-570-117-41	s	SWITCH, ROCKER (AC POWER) Included in Harness (SW-V).
FAN1	1-698-379-11	s	MOTOR, DC FAN
1pc	1-956-386-11	o	HARNESS (FAN) CN1 (to DUS-971 board) CN22 (to CN-1388 board)
1pc	1-956-387-11	o	HARNESS (ACIN-A) CN1 (to MB-721 board) CN20 (to CN-1388 board) CN23 (to CN-1388 board) CN101 (to AC inlet) CN103 (to Switching Regulator)
1pc	1-956-388-11	o	HARNESS (ACIN-B) CN2 (to MB-721 board) CN21 (to CN-1388 board) CN24 (to CN-1388 board) CN102 (to AC inlet) CN104 (to Switching Regulator)
1pc	1-956-392-11	o	HARNESS (LED) CN10 (to PS-453 board) CN11 (to DP-251 board)
1pc	1-956-399-11	o	HARNESS (+15V) CN4 (to PS-453 board) CN5 (to PS-453 board) CN302,CN303,CN304 (to Switching Regulator)
1pc	1-956-400-11	o	HARNESS (-15V) CN3 (to PS-453 board) Connector to Switching Regulator
1pc	1-956-401-11	o	HARNESS (DRAWER-A) CN1 (to AC inlet) CN6,CN8,CN9 (to PS-453 board) CN201 (to Power Supply Unit)
1pc	1-956-402-11	o	HARNESS (AC-A) CN301 (to Switching Regulator) Connector to Switching Regulator
1pc	1-956-403-11	o	HARNESS (SW-A) CN2 (to FL-235 board) Connector to Switching Regulator Connector to Seesaw Switch
1pc	1-956-493-11	o	HARNESS (GND) Includes the two connectors.
(CN-1388 board)			
CN20	1-562-210-11	o	CONTACT, FEMALE AWG18-22
	1-562-285-11	o	HOUSING 4P
CN21	1-562-210-11	o	CONTACT, FEMALE AWG18-22
	1-562-285-11	o	HOUSING 4P

NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

(FRAME)

Ref. No. or Q'ty	Part No.	SP Description
CN22	1-560-372-00	o TERMINAL, ILG, FEMALE
	1-561-515-00	o CONNECTOR HOUSING (3P)

CN23	1-560-372-00	o TERMINAL, ILG, FEMALE
	1-561-516-00	o PLAG, HOUSING, ILG 4P

CN24	1-560-372-00	o TERMINAL, ILG, FEMALE
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(DP-251 board)

CN11	1-569-193-11	o CONTACT, FEMALE
	1-569-196-11	o HOUSING 3P

(DUS-971 board)

CN1	1-560-372-00	o TERMINAL, ILG, FEMALE
	1-561-515-00	o CONNECTOR HOUSING (3P)

(FL-235 board)

CN2	△ 1-562-210-11	o CONTACT, FEMALE AWG18-22
	1-562-286-11	o HOUSING 5P

(MB-720 board)

CN1	1-562-210-11	o CONTACT, FEMALE AWG18-22
-----	--------------	----------------------------

CN2	1-562-210-11	o CONTACT, FEMALE AWG18-22
-----	--------------	----------------------------

(PS-453 board)

CN3	1-562-210-11	o CONTACT, FEMALE AWG18-22
	1-562-285-11	o HOUSING 4P

CN4	1-562-210-11	o CONTACT, FEMALE AWG18-22
	1-562-287-11	o HOUSING 6P

CN5	1-560-372-00	o TERMINAL, ILG, FEMALE
	1-561-515-00	o CONNECTOR HOUSING (3P)

CN6	△ 1-562-210-11	o CONTACT, FEMALE AWG18-22
	1-563-888-11	s HOUSING, 10P

CN8	△ 1-562-210-11	o CONTACT, FEMALE AWG18-22
	1-562-285-11	o HOUSING 4P

CN9	1-560-372-00	o TERMINAL, ILG, FEMALE
	1-561-516-00	o PLAG, HOUSING, ILG 4P

CN10	1-569-193-11	o CONTACT, FEMALE
	1-569-196-11	o HOUSING 3P

(Switching Regulator)

CN103	1-580-352-11	o HOUSING, 20P
	△ 1-580-358-11	o CONTACT, AWG20-24, FEMALE
	1-580-359-11	o CONTACT, AWG20-24, FEMALE

CN104	1-580-352-11	o HOUSING, 20P
	△ 1-580-358-11	o CONTACT, AWG20-24, FEMALE
	1-580-359-11	o CONTACT, AWG20-24, FEMALE

CN301	△ 1-560-764-21	o CONTACT, FEMALE AWG18-24
	1-562-817-11	o HOUSING, CONNECTOR 2P

CN302	1-535-243-21	o CONTACT, CONNECTOR
	1-561-148-00	o HOUSING, CONNECTOR 4P

CN303	1-535-243-21	o CONTACT, CONNECTOR
	1-561-148-00	o HOUSING, CONNECTOR 4P

CN304	1-535-243-21	o CONTACT, CONNECTOR
	1-561-148-00	o HOUSING, CONNECTOR 4P

(Power Supply Unit)

CN201	△ 1-580-349-11	o HOUSING, 20P
-------	----------------	----------------

(FRAME)

Ref. No. or Q'ty	Part No.	SP Description
	△ 1-580-358-11	o CONTACT, AWG20-24, FEMALE
	1-580-359-11	o CONTACT, AWG20-24, FEMALE

(AC inlet)

CN1	△ 1-562-210-11	o CONTACT, FEMALE AWG18-22
-----	----------------	----------------------------

CN101	△ 1-580-375-11	s INLET 3P
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CN102	△ 1-580-375-11	s INLET 3P
-------	----------------	------------

NOTE : Please see page 5-8 for the parts that are not listed in the parts list.

 PACKING MATERIALS & SUPPLIED ACCESSORIES

Ref. No.

or Q'ty Part No. SP Description

3pcs	1-695-542-11	o TERMINATOR, BNC 75 ohm
1pc	1-764-805-11	o CONNECTOR, BNC
32pcs	1-778-702-11	o CONNECTOR PLUG 6P
2pcs	3-180-039-01	s SCREW, CONNECTOR
1pc	3-704-355-01	o SHEET (STADARD), PROTECTION
32pcs	3-709-117-01	o COVER, CONNECTOR

NOTE : Please see page 5-8 for the parts that are not listed
 in the parts list.

Section 6

Semiconductor Pin Assignments


ここに記載されている半導体は、それぞれの機能を等価的に表したものです。なお、互換性のない型名を併記していることがありますので、部品を交換するときは、Spare Partsの章を参照してください。

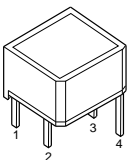
等価回路は I C メーカーのデータブックに従いました。

Semiconductors of which functions are equivalent are described here. For parts replacement, refer to the section of Spare Parts in this manual. The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

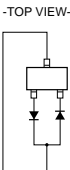
DIODE	PAGE	TRANSISTOR	PAGE	IC	PAGE	IC	PAGE
1SS119-25	6-2	2SA1162-G	6-2	AM26C32CN	6-3	SN74HC02ANS	6-9
1SS119-25TD	6-2	2SA1175-FEK	6-2	AM26LS30PC	6-3	SN74HC02ANS-E05	6-9
1SS123-T1	6-2	2SA1175-HFE	6-2			SN74HC04ANS	6-9
1SS226	6-2	2SA1175TP-FEK	6-2	BA6212	6-3	SN74HC04ANS-E05	6-9
		2SA1175TP-HFE	6-2	BQ4011YMA-100	6-3	SN74HC08ANS	6-9
D30SC4M	6-2	2SA1462-T1Y33Y34	6-2			SN74HC08ANS-E05	6-9
		2SA1462-Y33	6-2	CXA1432M	6-4	SN74HC132ANS	6-9
ERC84-009	6-2	2SA812-T1-M5M6	6-2	CXA1432M-T4	6-4	SN74HC132ANS-E05	6-9
		2SC2785-HFE	6-2	CXD1095Q	6-4	SN74HC138ANS	6-9
GL-6R202	6-2	2SC2785TP-E	6-2	CXK58257ASP-10L	6-5	SN74HC138ANS-E05	6-9
		2SC2785TP-HFE	6-2			SN74HC14ANS	6-9
HLMP-6300-010	6-2	2SC3545-T1T43T44	6-2	DG408DJ	6-5	SN74HC14ANS-E05	6-9
HLMP-6500-010	6-2	2SC3545-T43	6-2			SN74HC164ANS	6-10
				GAL16V8B-25LP	6-5	SN74HC164ANS-E05	6-10
L501B-SRG-P	6-2	RN1201	6-2			SN74HC174ANS	6-10
				LM1881M	6-6	SN74HC174ANS-E05	6-10
				LM311PS	6-6	SN74HC245ANS	6-10
				LM311PS-E05	6-6	SN74HC245ANS-E05	6-10
				LT1252CS8	6-6	SN74HC32ANS	6-10
				LT1252CS8-E2	6-6	SN74HC32ANS-E05	6-10
						SN74HC541ANS	6-10
				M27C1001-12F1	6-6	SN74HC541ANS-E05	6-10
				MAX202CSE	6-7	SN74HC573BNS-E05	6-11
				MAX202CSE-TE2	6-7	SN74HC74ANS	6-11
				MC14495P1	6-7	SN74HC74ANS-E05	6-11
				MC14555BF	6-7	SN74HC86ANS-E05	6-12
				MC14555BFEL	6-7	SN74LS07NS	6-11
				MC74HC688N	6-7	SN74LS07NS-E05	6-11
				MSM62X42BRS-A	6-8		
						TC74HC123AF	6-11
				NE5532P	6-8	TC74HC154AP	6-11
				NJM4560D-D	6-8	TC74HC221AF	6-12
						TC74HC688AP	6-7
				PALCE16V8H-25PC/4	6-5	TC74HC86AF	6-12
				PEEL18CV8P-25	6-8	TL7705CP-B	6-12
				PEEL18CV8PC-25	6-8		
						UPC311C	6-12
				SN74HC00ANS	6-8	UPD70325L-10	6-12
				SN74HC00ANS-E05	6-8	UPD72001C-11	6-14

DIODE

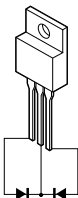
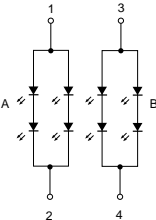
 1SS119-25
ERC84-009
1SS119-25TD



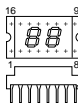
L501B-SRG-P;A=RED,B=GRN



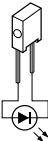
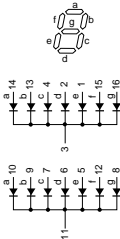
1SS226
1SS123-T1



D30SC4M

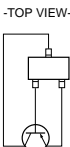


GL-6R202;RED

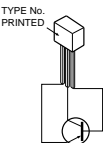


HLMP-6300-010;RED
HLMP-6500-010;GREEN

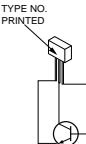
TRANSISTOR



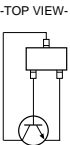
2SA1162-G
2SA1462-Y33
2SA812-T1-M5M6
2SA1462-T1Y33Y34



2SA1175-FEK
2SA1175-HFE
2SA1175TP-FEK
2SA1175TP-HFE



2SC2785-HFE
2SC2785TP-HFE
2SC2785TP-E



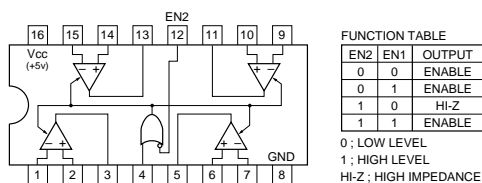
2SC3545-T43
2SC3545-T1T43T44



RN1201 (R1=4.7K,R2=4.7K)

AM26C32CN (TI)

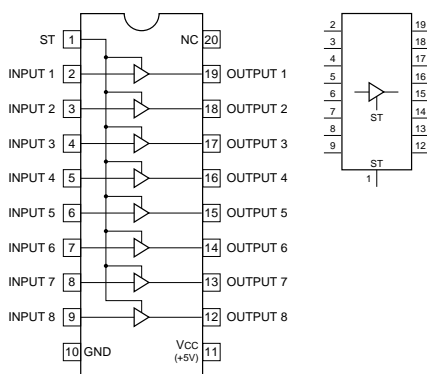
HIGH SPEED DIFFERENTIAL LINE RECEIVER
—TOP VIEW—



	SENSE	INPUT VOLT
C32/LS32	±200mV	±7V
LS33	±500mV	±15V

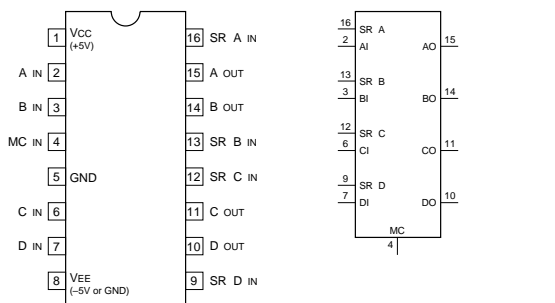
BA6212 (ROHM)

LARGE CURRENT DRIVER
—TOP VIEW—

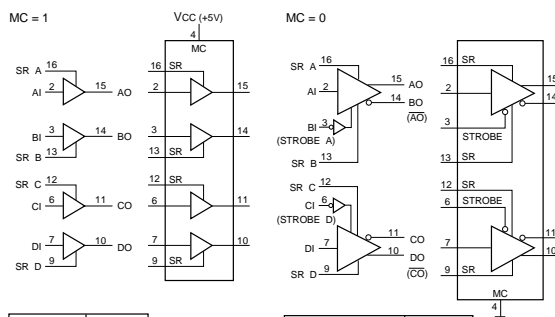


AM26LS30PC (ADVANCED MICRO DEVICES)

LINE DRIVER
—TOP VIEW—



MC ; MODE CONTROL
SR ; SLEW RATE CONTROL



INPUTS	OUTPUTS
MC	A TO D
1	0
1	1

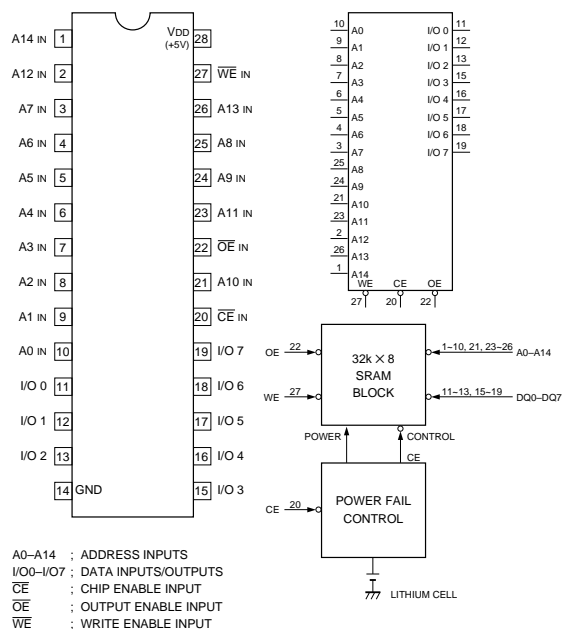
0 ; LOW LEVEL
1 ; HIGH LEVEL

INPUTS			OUTPUTS	
MC	STROBE	A & D	A & D	B & C
0	0	0	0	1
0	0	1	1	0
0	1	X	HI-Z	HI-Z

X; DON'T CARE
HI-Z; HIGH IMPEDANCE

BQ4011YMA-100 (BENCHMARQ)

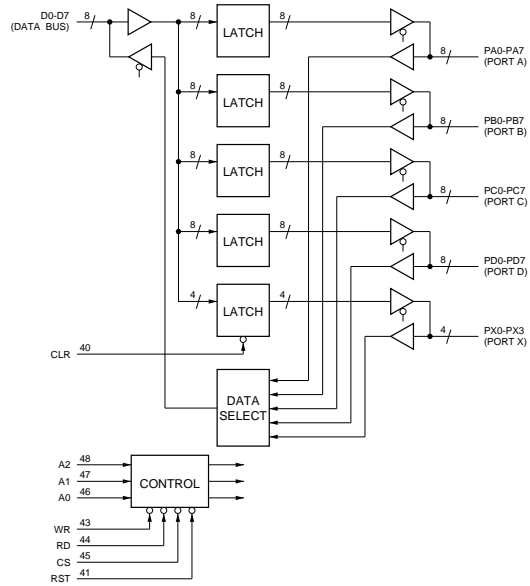
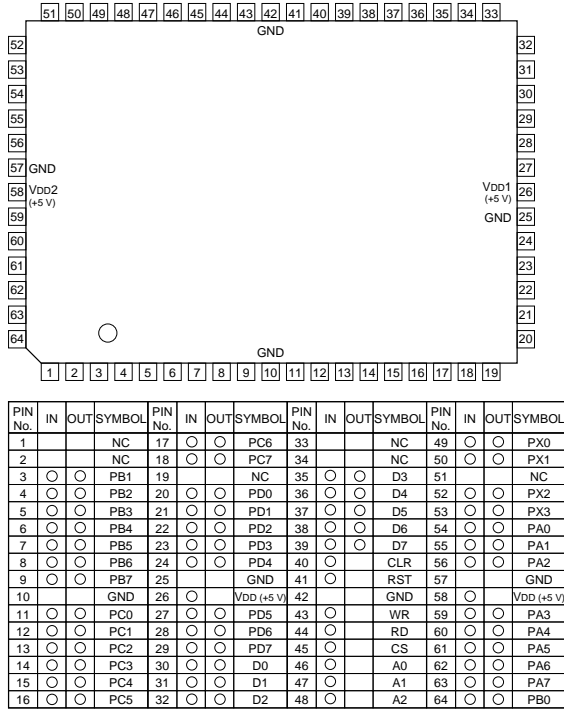
C-MOS 32K×8 NONVOLATILE SRAM
—TOP VIEW—



CXD1095Q (SONY)

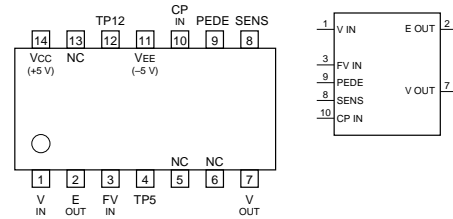
C-MOS I/O PORT EXPANDER

—TOP VIEW—

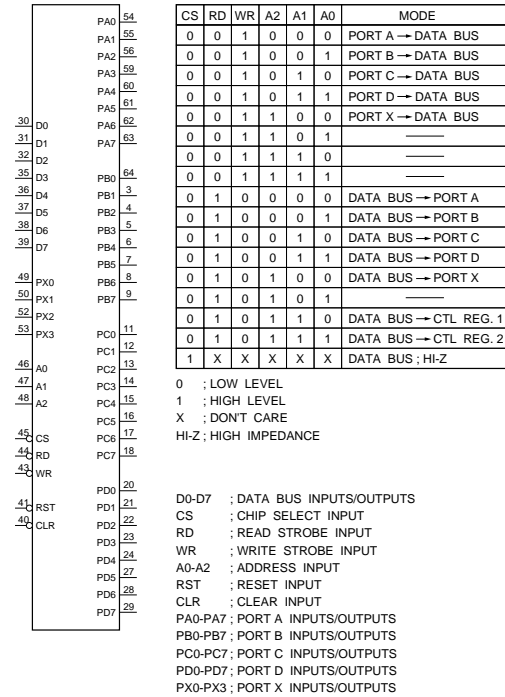
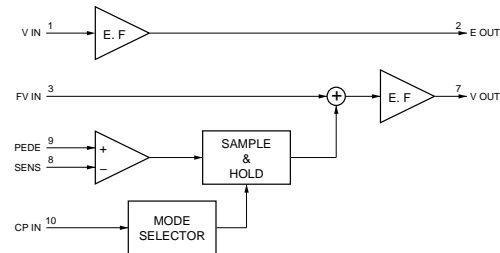
CXA1432M (SONY) FLAT PACKAGE
CXA1432M-T4

VIDEO SIGNAL CLAMPER

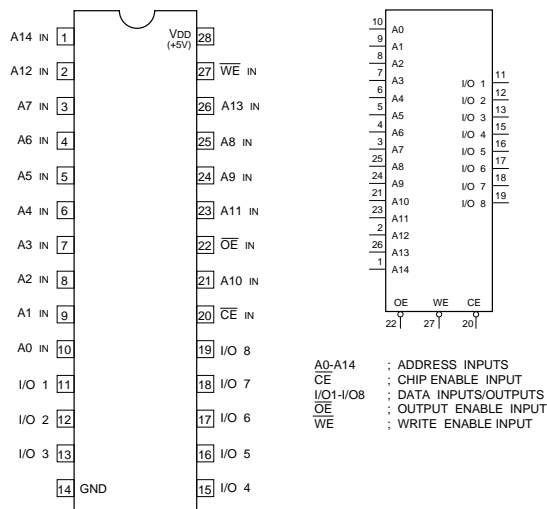
—TOP VIEW—



CP IN : CLAMP PULSE INPUT
 E OUT : BUFFER AMP OUTPUT
 FV IN : FLOATING VIDEO SIGNAL INPUT
 PEDE : CLAMP LEVEL DC INPUT
 SENS : CLAMP POINT SIGNAL INPUT
 TP5, TP12 : FOR TEST
 V IN : VIDEO SIGNAL INPUT
 V OUT : VIDEO SIGNAL OUTPUT



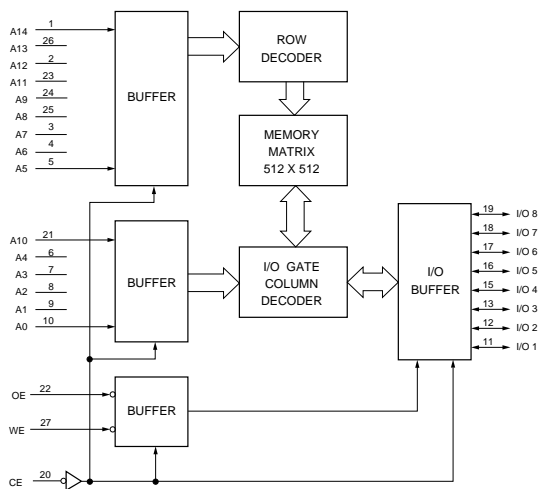
CXK58257ASP-10L (SONY)

C-MOS 256K (32768x8)-BIT STATIC RAM
—TOP VIEW—

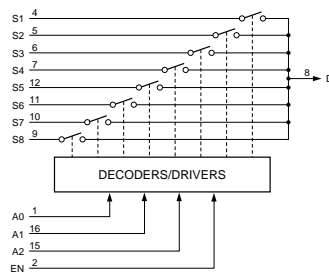
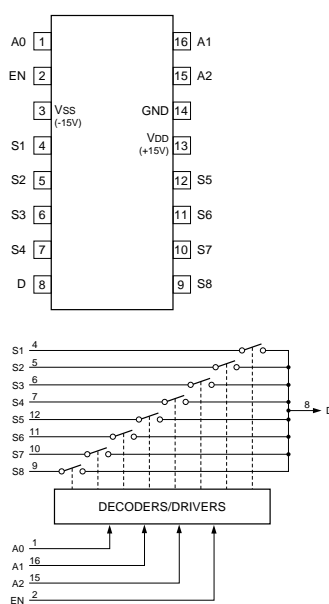
A0-A14 : ADDRESS INPUTS
CE : CHIP ENABLE INPUT
I/O1-I/O8 : DATA INPUTS/OUTPUTS
OE : OUTPUT ENABLE INPUT
WE : WRITE ENABLE INPUT

CE	OE	WE	MODE	I/O TERMINAL
1	X	X	NOT SELECT	HIGH IMPEDANCE
0	1	1	OUTPUT DISABLE	HIGH IMPEDANCE
0	0	1	READ	OUTPUT DATA
0	X	0	WRITE	INPUT DATA

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

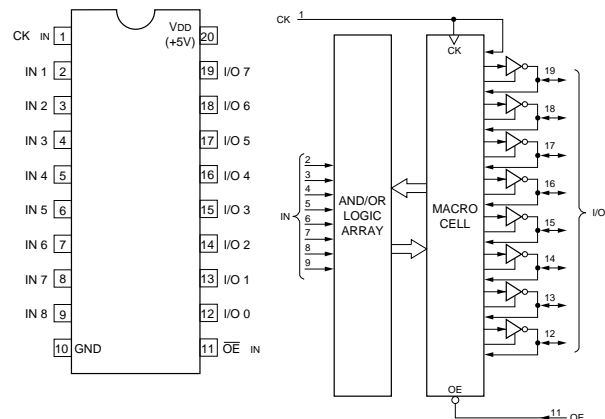
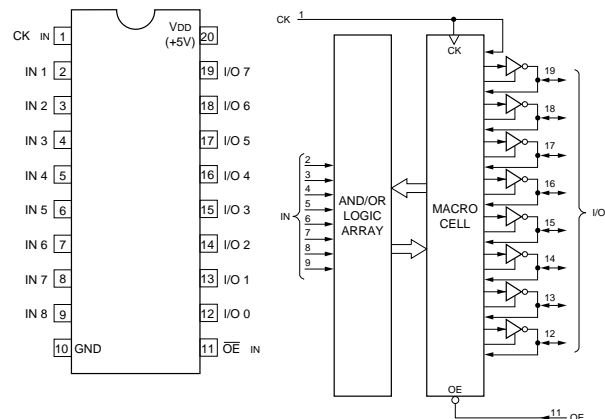


DG408DJ (SILICONIX)

C-MOS 8-CHANNEL SINGLE-ENDED ANALOG MULTIPLEXER
—TOP VIEW—

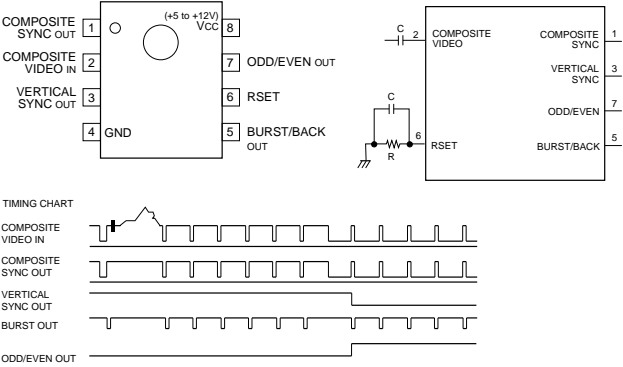
GAL16V8B-25LP (LATTICE)

PALCE16V8H-25PC/4 (AMD/MONOLITHIC MEMORIES)

C-MOS ELECTRICALLY ERASABLE PROGRAMMABLE LOGIC DEVICE
—TOP VIEW—

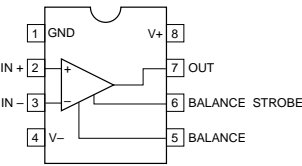
LM1881M (NS)FLAT PACKAGE

VIDEO SYNC SEPARATOR
—TOP VIEW—



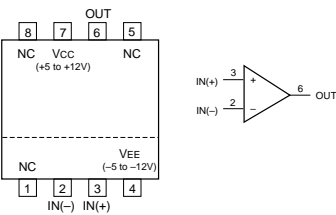
LM311PS (TI)FLAT PACKAGE
LM311PS-E05

VOLTAGE COMPARATOR WITH STROBE
—TOP VIEW—



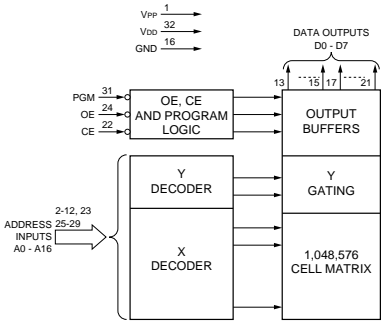
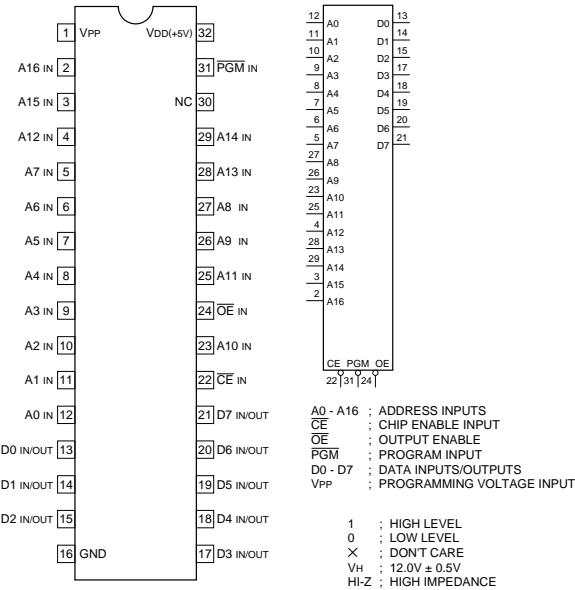
LT1252CS8 (LINEAR TECH)FLAT PACKAGE
LT1252CS8-E2

VIDEO AMPLIFIER
—TOP VIEW—



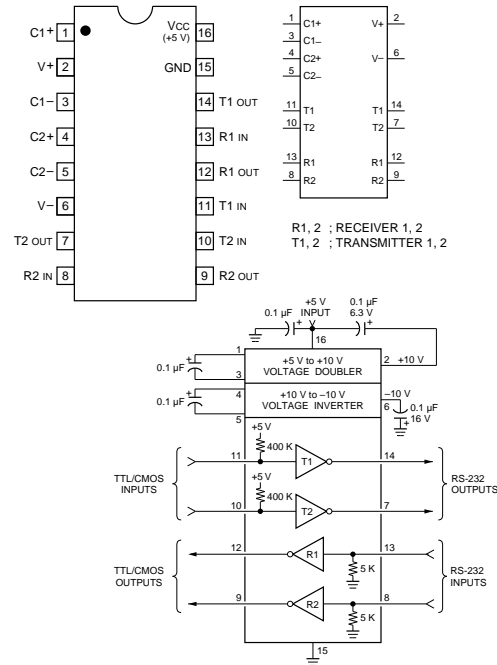
M27C1001-12F1 (SGS)

C-MOS 1M (128k × 8)-BIT UV EPROM
-TOP VIEW-



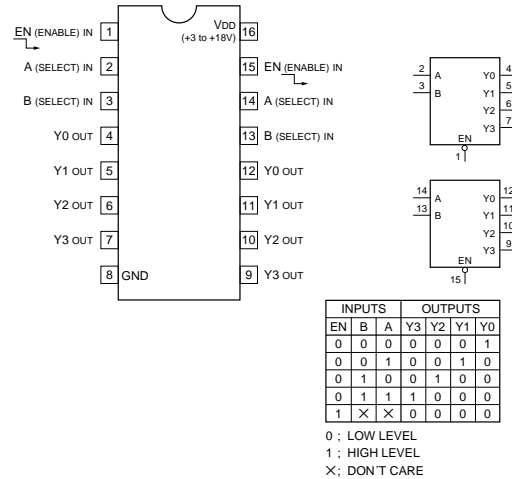
MAX202CSE (MAXIM) MAX202CSE-TE2

RS-232 TRANSMITTER/RECEIVER — TOP VIEW —



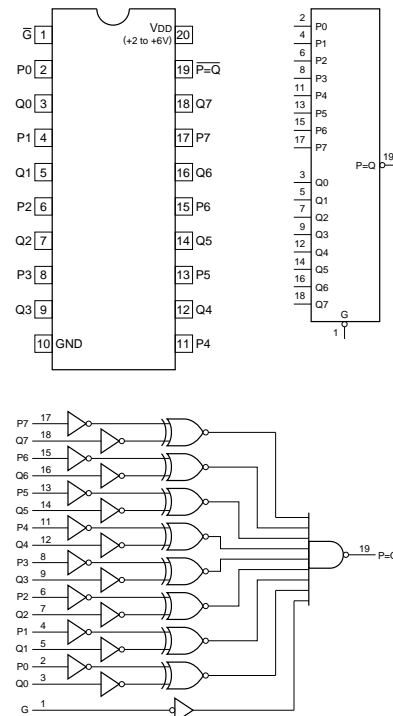
MC14555BF (MOTOROLA) FLAT PACKAGE MC14555BFEL

C-MOS BINARY TO 1-OF-4 DECODER/DEMULTIPLEXER — TOP VIEW —



MC74HC688N (MOTOROLA) TC74HC688AP

C-MOS 8-BIT EQUALITY DETECTOR — TOP VIEW —

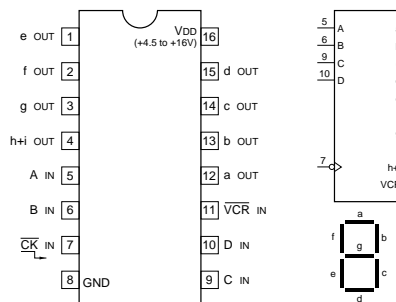


INPUTS			OUTPUT
P, Q	G	P=Q	
P=Q	0	0	
P>Q	0	1	
P<Q	0	1	
X	1	1	

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

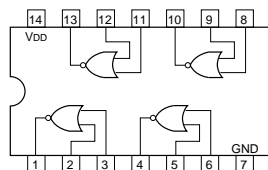
MC14495P1 (MOTOROLA)

C-MOS BCD-TO-SEVEN-SEGMENT 4-BIT LATCH / DECODER DRIVER — TOP VIEW —



INPUTS				OUTPUTS							DISPLAY
CK	D	C	B	A	a	b	c	d	e	f	
0	0	0	0	0	1	1	1	1	1	0	Z
0	0	0	0	1	0	1	1	0	0	0	Z
0	0	0	1	0	1	1	0	1	0	1	Z
0	0	0	1	1	1	1	1	0	0	1	Z
0	0	1	0	0	0	1	1	0	0	1	Z
0	0	1	0	1	0	1	1	0	1	0	Z
0	0	1	1	0	1	1	0	1	1	0	Z
0	0	1	1	1	0	1	1	1	0	0	Z
0	1	0	0	0	1	1	1	1	1	0	Z
0	1	0	0	1	1	1	1	1	1	0	Z
0	1	0	1	0	1	1	1	1	1	0	Z
0	1	0	1	1	0	1	1	1	1	0	Z
0	1	1	0	0	1	1	1	1	1	0	Z
0	1	1	0	1	0	1	1	1	1	0	Z
0	1	1	1	0	0	1	1	1	1	0	Z
0	1	1	1	1	0	0	1	1	1	0	Z
0	1	1	1	1	0	0	0	1	1	1	O
1	X	X	X	X	X	X	X	X	X	X	Z/O
1	X	X	X	X	X	X	X	X	X	X	Z/O

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
Z ; HIGH IMPEDANCE

SN74HC02ANS (TI) FLAT PACKAGE
SN74HC02ANS-E05
C-MOS QUAD 2-INPUT NOR GATES
 —TOP VIEW—


$$Y = \overline{A + B} = \overline{A} \cdot \overline{B}$$

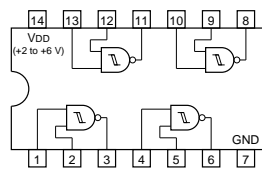
$$Y = \overline{A + B} = \overline{A} \cdot \overline{B}$$

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

NOTE:

TYPE	V _{DD}
HC	+2 to +6V
AC/VHC	+2 to +5.5V
HCT/ACT	+5V

SN74HC132ANS (TI) FLAT PACKAGE
SN74HC132ANS-E05
C-MOS 2-INPUT NAND SCHMITT TRIGGER
 —TOP VIEW—


$$Y = \overline{A \cdot B} = \overline{A} + \overline{B}$$

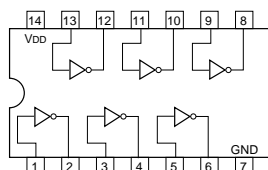
$$Y = \overline{A \cdot B} = \overline{A} + \overline{B}$$

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

NOTE:

TYPE	V _{DD}
HC	+2 to +6 V
VHC	+2 to +5.5 V

SN74HC04ANS (TI) FLAT PACKAGE
SN74HC04ANS-E05
C-MOS HEX INVERTERS
 —TOP VIEW—


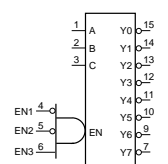
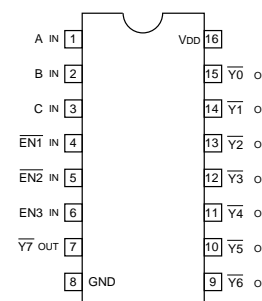
$$Y = \overline{A}$$

A	Y
0	1
1	0

0; LOW LEVEL
1; HIGH LEVEL

NOTE:

TYPE	V _{DD}
74HCT04 TYPE	+5V
TC74AC04 TYPE	+2 to +5.5V
TC74VHC04 TYPE	+4.5 to +5.5V
74ACT04 TYPE	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

SN74HC138ANS (TI) FLAT PACKAGE
SN74HC138ANS-E05
C-MOS 3-TO-8 LINE DECODER / DEMULTIPLEXER
 —TOP VIEW—


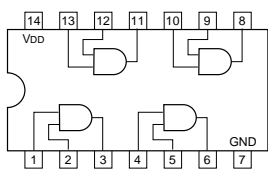
INPUTS				OUTPUTS							
EN	C	B	A	Y7	Y6	Y5	Y4	Y3	Y2	Y1	Y0
0	X	X	X	1	1	1	1	1	1	1	1
1	0	0	0	1	1	1	1	1	1	1	0
1	0	0	1	1	1	1	1	1	1	0	1
1	0	1	0	1	1	1	1	1	0	1	1
1	0	1	1	1	1	1	1	0	1	1	1
1	1	0	0	1	1	1	0	1	1	1	1
1	1	0	1	1	1	0	1	1	1	1	1
1	1	1	0	1	0	1	1	1	1	1	1
1	1	1	1	0	1	1	1	1	1	1	1

EN = EN1 • EN2 • EN3

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

NOTE:

TYPE	V _{DD}
74HCT138 TYPE	+5V
74ACT138 TYPE	+4.5 to +5.5V
TC74AC138 TYPE	+2 to +5.5V
TC74VHC138	+2 to +5.5V
OTHER TYPES	+2 to +6V

SN74HC08ANS (TI) FLAT PACKAGE
SN74HC08ANS-E05
C-MOS QUAD 2-INPUT AND GATES
 —TOP VIEW—


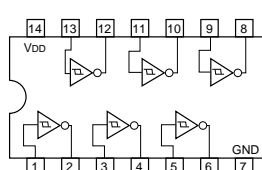
$$Y = A \cdot B = \overline{\overline{A} + \overline{B}}$$

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0; LOW LEVEL
1; HIGH LEVEL

NOTE:

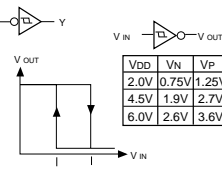
TYPE	V _{DD}
AC	+2 to +5.5V
TC40H	+2 to +8V
ACT/HCT	+5V
OTHER TYPES	+2 to +6V

SN74HC14ANS (TI) FLAT PACKAGE
SN74HC14ANS-E05
C-MOS HEX SCHMITT TRIGGER INVERTERS
 —TOP VIEW—


$$Y = \overline{A}$$

A	Y
0	1
1	0

0; LOW LEVEL
1; HIGH LEVEL

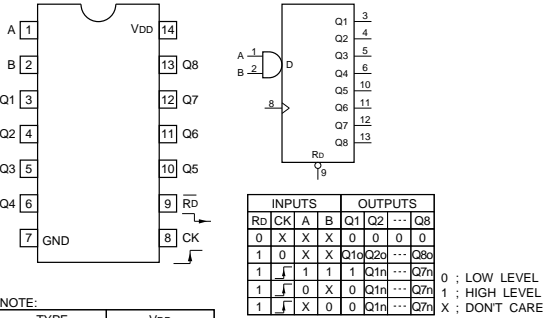


NOTE:

TYPE	V _{DD}
TC74AC/VHC	+2V to +5.5V
OTHER TYPES	+2V to +6V

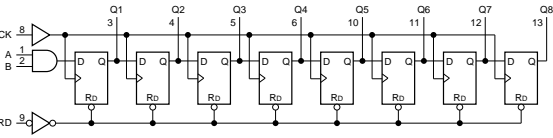
SN74HC164ANS (TI)FLAT PACKAGE
SN74HC164ANS-E05

C-MOS 8-BIT SERIAL-IN/PARALLEL-OUT SHIFT REGISTER
—TOP VIEW—



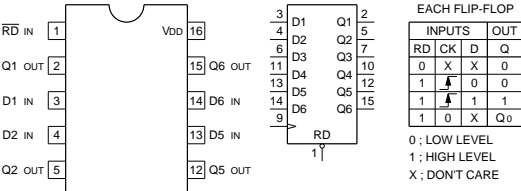
NOTE:

TYPE	VDD
AC/VHC	+2 to +5.5 V
HC	+2 to +6 V
HCT	+5 V



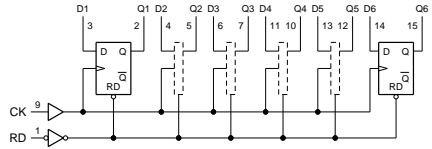
SN74HC174ANS (TI)FLAT PACKAGE
SN74HC174ANS-E05

C-MOS D-TYPE FLIP-FLOP WITH RESET
- TOP VIEW -



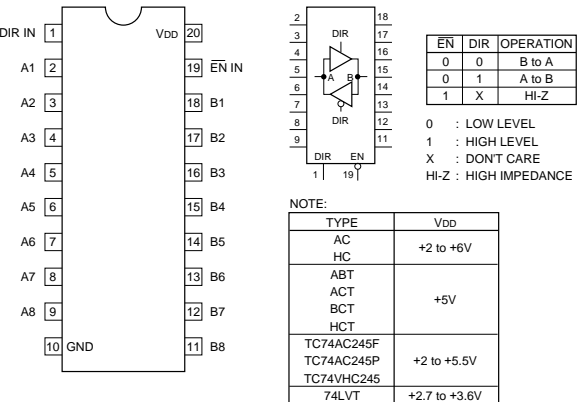
NOTE :

TYPE	VDD
ACT/HCT	+5V
TC74AC/TC74VHC	+2 to +5.5V
OTHER TYPES	+2 to +6V



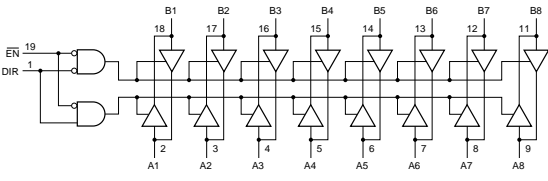
SN74HC245ANS (TI)FLAT PACKAGE
SN74HC245ANS-E05

C-MOS BILATERAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS
-TOP VIEW-



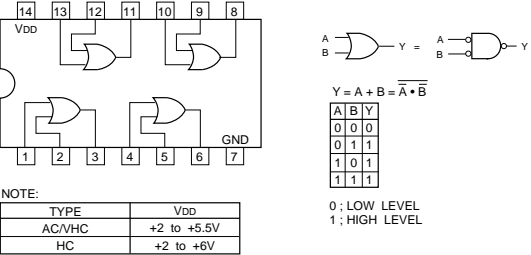
NOTE:

TYPE	VDD
AC	+2 to +6V
HC	
ABT	
ACT	
BCT	
HCT	
TC74AC245F	
TC74AC245P	
TC74VHC245	+2 to +5.5V
74LVT	+2.7 to +3.6V



SN74HC32ANS (TI)FLAT PACKAGE
SN74HC32ANS-E05

C-MOS QUAD 2-INPUT OR GATES
—TOP VIEW—

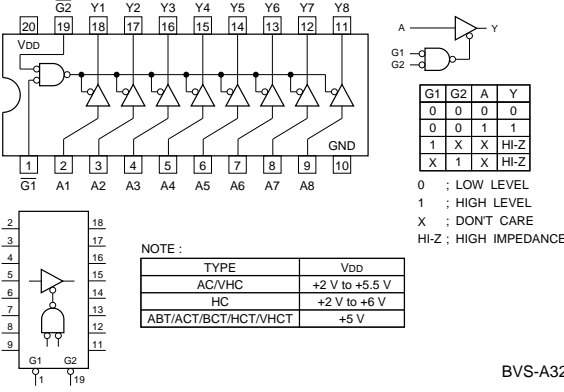


NOTE:

TYPE	VDD
AC/VHC	+2 to +5.5V
HC	+2 to +6V

SN74HC541ANS (TI)FLAT PACKAGE
SN74HC541ANS-E05

C-MOS BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS
— TOP VIEW —



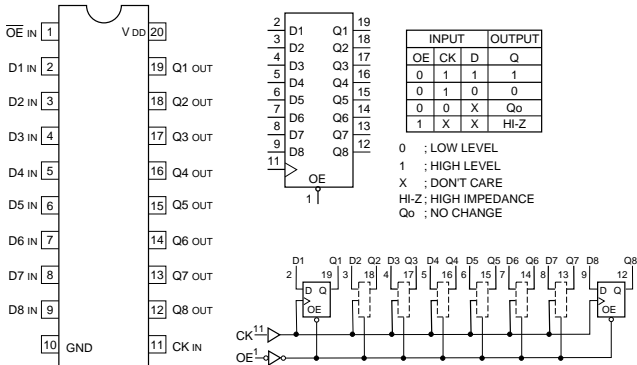
NOTE :

TYPE	VDD
AC/VHC	+2 V to +5.5 V
HC	+2 V to +6 V
ABT/ACT/BCT/HCT/VHCT	+5 V

SN74HC573BNS-E05 (TI) FLAT PACKAGE

C-MOS 3-STATE OUTPUTS OCTAL LATCHES

- TOP VIEW -



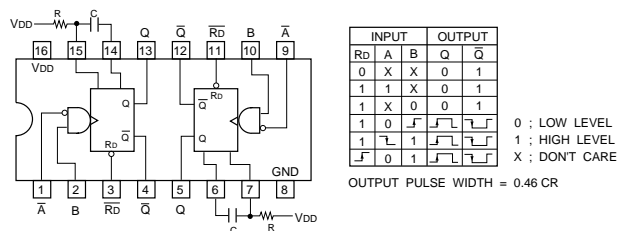
NOTE :

TYPE	V _{DD}
AC	+2 to +6V
HC	
ABT	+5V
ACT	
HCT / VHCT	
TC74AC573	+2 to +5.5V

TC74HC123AF (TOSHIBA) FLAT PACKAGE

C-MOS DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS

-TOP VIEW-



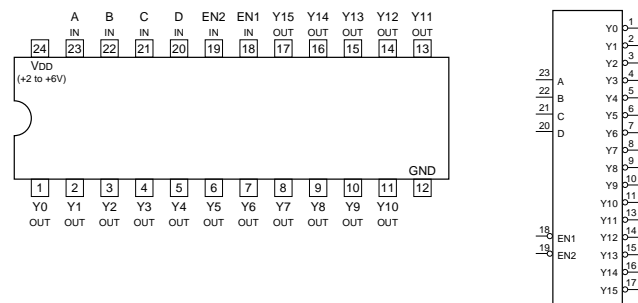
NOTE :

TYPE	V _{DD}
TC74HC123AF	+5V
OTHER TYPES	+2V to +6V

TC74HC154AP (TOSHIBA)

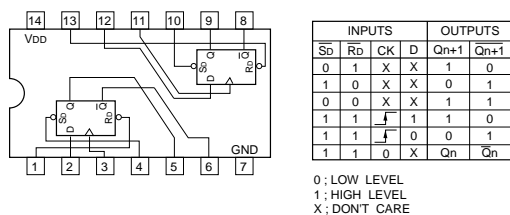
C-MOS 4-TO-16 LINE DECODER/DEMULPLEXER

-TOP VIEW-

SN74HC74ANS (TI) FLAT PACKAGE
SN74HC74ANS-E05

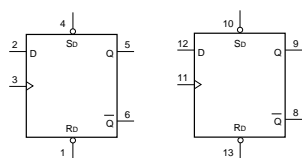
C-MOS DUAL D-TYPE FLIP-FLOPS WITH DIRECT SET/RESET

-TOP VIEW-



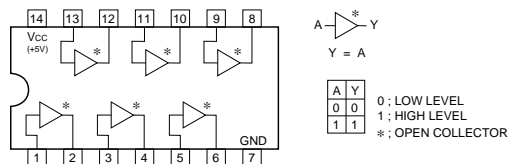
NOTE:

TYPE	V _{DD}
HCT/ACT	+5V
TC74AC/VHC	+2 to +5.5V
OTHERS	+2 to +6V

SN74LS07NS (TI) FLAT PACKAGE
SN74LS07NS-E05

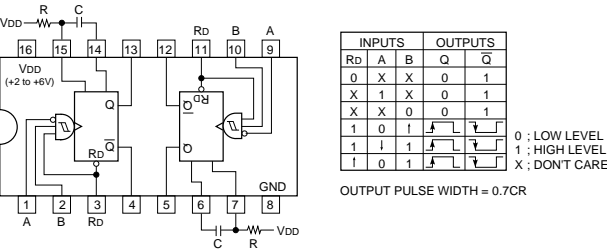
TTL BUFFER/DRIVER WITH OPEN-COLLECTOR

-TOP VIEW-

0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE

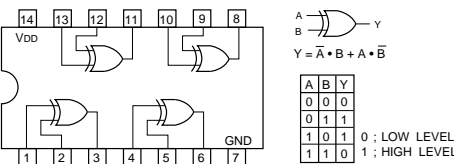
TC74HC221AF (TOSHIBA)FLAT PACKAGE

C-MOS MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
—TOP VIEW—



TC74HC86AF (TOSHIBA)FLAT PACKAGE
SN74HC86ANS-E05

C-MOS QUAD EXCLUSIVE OR GATES
—TOP VIEW—

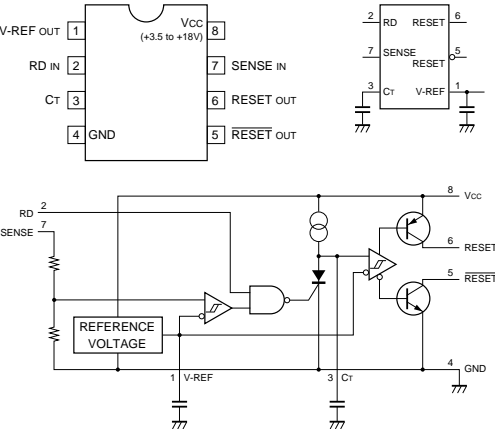


NOTE :

TYPE	Vdd
TC74AC/VHC	+2V to +5.5V
TC74HCT	+5V
OTHER TYPES	+2V to +6V

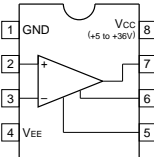
TL7705CP-B (TI)

POWER VOLTAGE SUPERVISOR
—TOP VIEW—



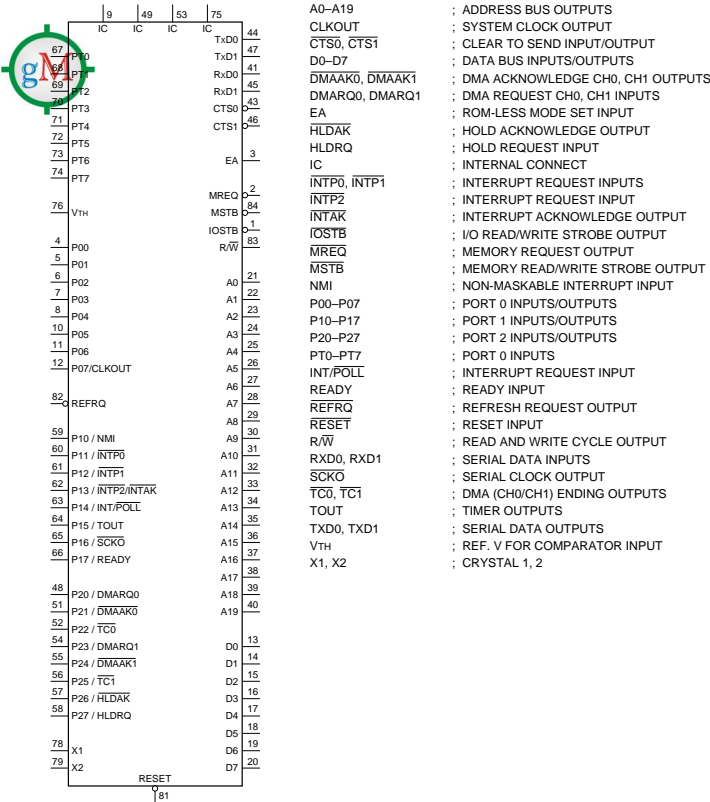
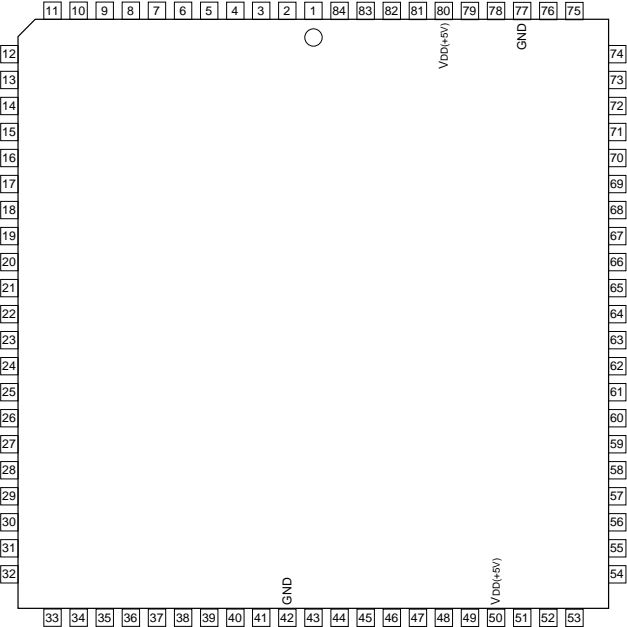
UPC311C (NEC)

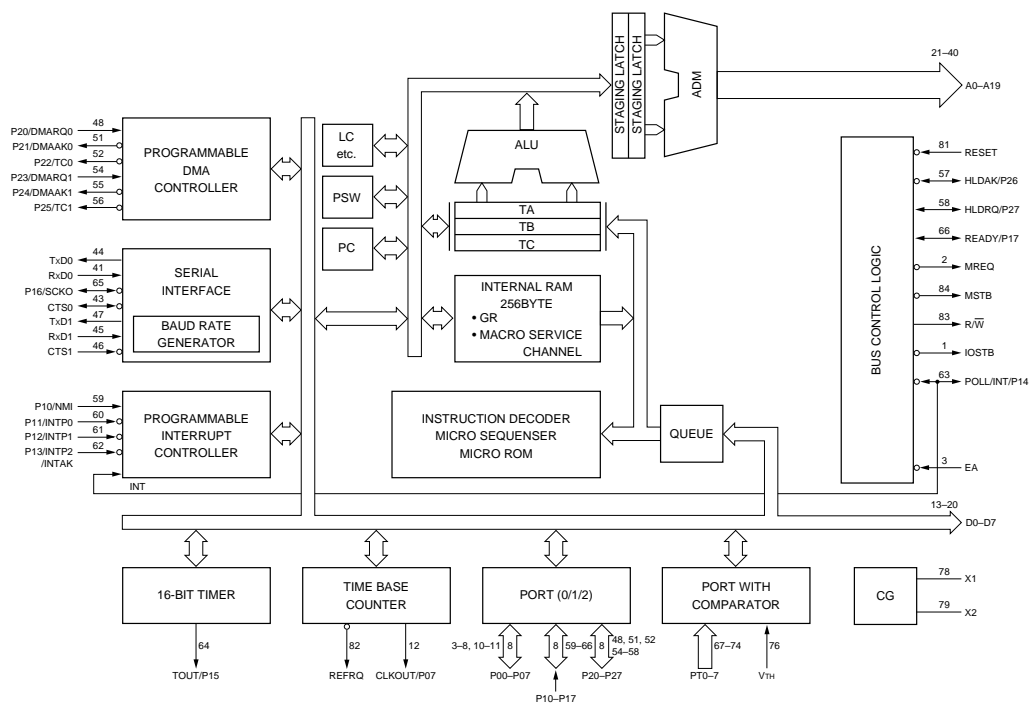
VOLTAGE COMPARATOR
—TOP VIEW—



UPD70325L-10 (NEC)

C-MOS 16-BIT MICROPROCESSOR
—TOP VIEW—



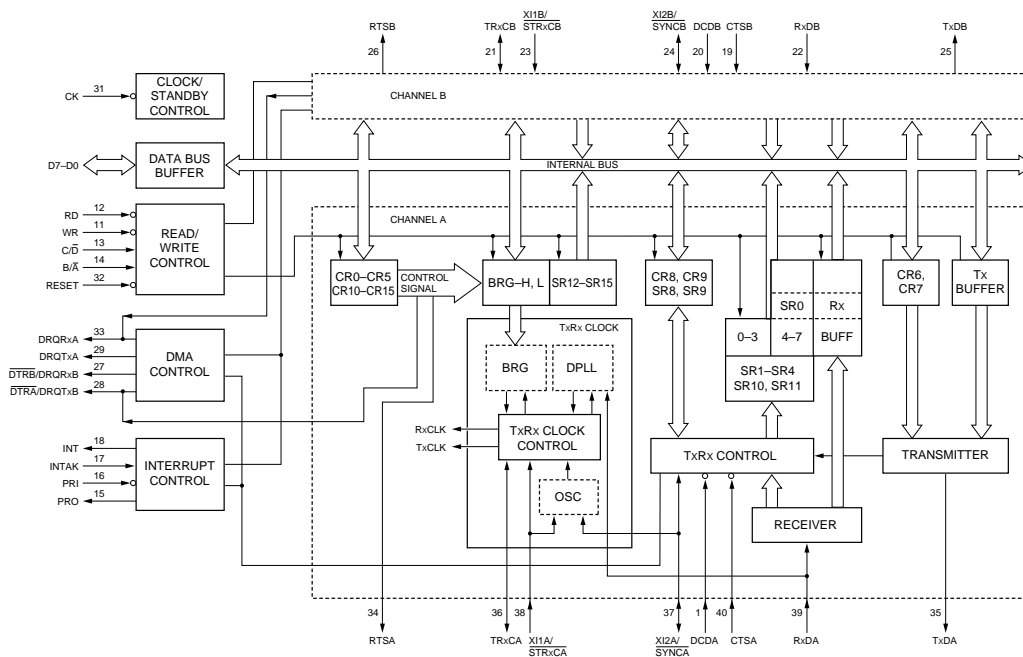
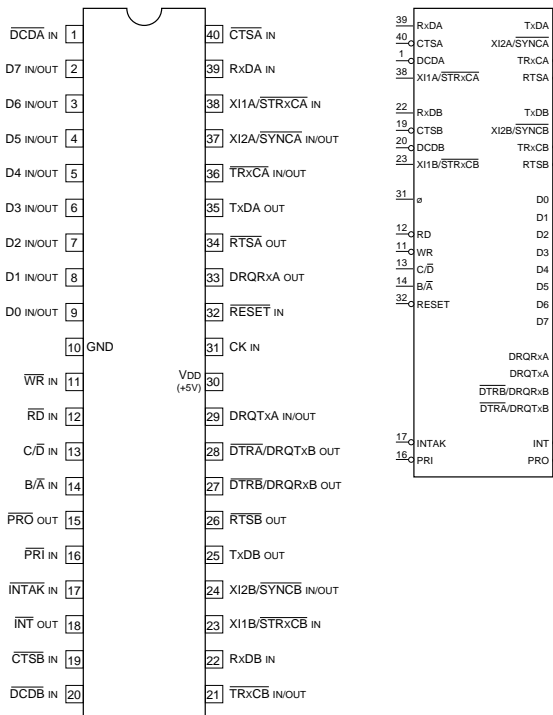


PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL
1	O	IOSTB	29	O	A8	57	I/O	P26/HLDAR
2	O	MREQ	30	O	A9	58	I/O	P27/HLDAR
3	I	EA	31	O	A10	59	I/O	P10/NMI
4	I/O	P00	32	O	A11	60	I/O	P11/INTP0
5	I/O	P01	33	O	A12	61	I/O	P12/INTP1
6	I/O	P02	34	O	A13	62	I/O	P13/INTP2/INTAK
7	I/O	P03	35	O	A14	63	I/O	P14/INT/POLL
8	I/O	P04	36	O	A15	64	I/O	P15/TOUT
9	—	IC	37	O	A16	65	I/O	P16/SCKO
10	I/O	P05	38	O	A17	66	I/O	P17/READY
11	I/O	P06	39	O	A18	67	I	PT0
12	I/O	P07/CLKOUT	40	O	A19	68	I	PT1
13	I/O	D0	41	I	RXD0	69	I	PT2
14	I/O	D1	42	—	GND	70	I	PT3
15	I/O	D2	43	I/O	CTS0	71	I	PT4
16	I/O	D3	44	O	TXD0	72	I	PT5
17	I/O	D4	45	I	RXD1	73	I	PT6
18	I/O	D5	46	I	CTS1	74	I	PT7
19	I/O	D6	47	O	TXD1	75	—	IC
20	I/O	D7	48	I/O	P20/DMAQ0	76	I	VTH
21	O	A0	49	—	IC	77	—	GND
22	O	A1	50	I	VDD(+5V)	78	—	X1
23	O	A2	51	I/O	P21/DMAA0	79	—	X2
24	O	A3	52	I/O	P22/TC0	80	I	VDD(+5V)
25	O	A4	53	—	IC	81	I	RESET
26	O	A5	54	I/O	P23/DMAQ1	82	O	REFREQ
27	O	A6	55	I/O	P24/DMAA1	83	O	R/W
28	O	A7	56	I/O	P25/TC1	84	O	MSTB

UPD72001C-11 (NEC) (CLOCK FREQUENCY:11MHz)

C-MOS ADVANCED MULTI-PROTOCOL SERIAL CONTROLLER

—TOP VIEW—



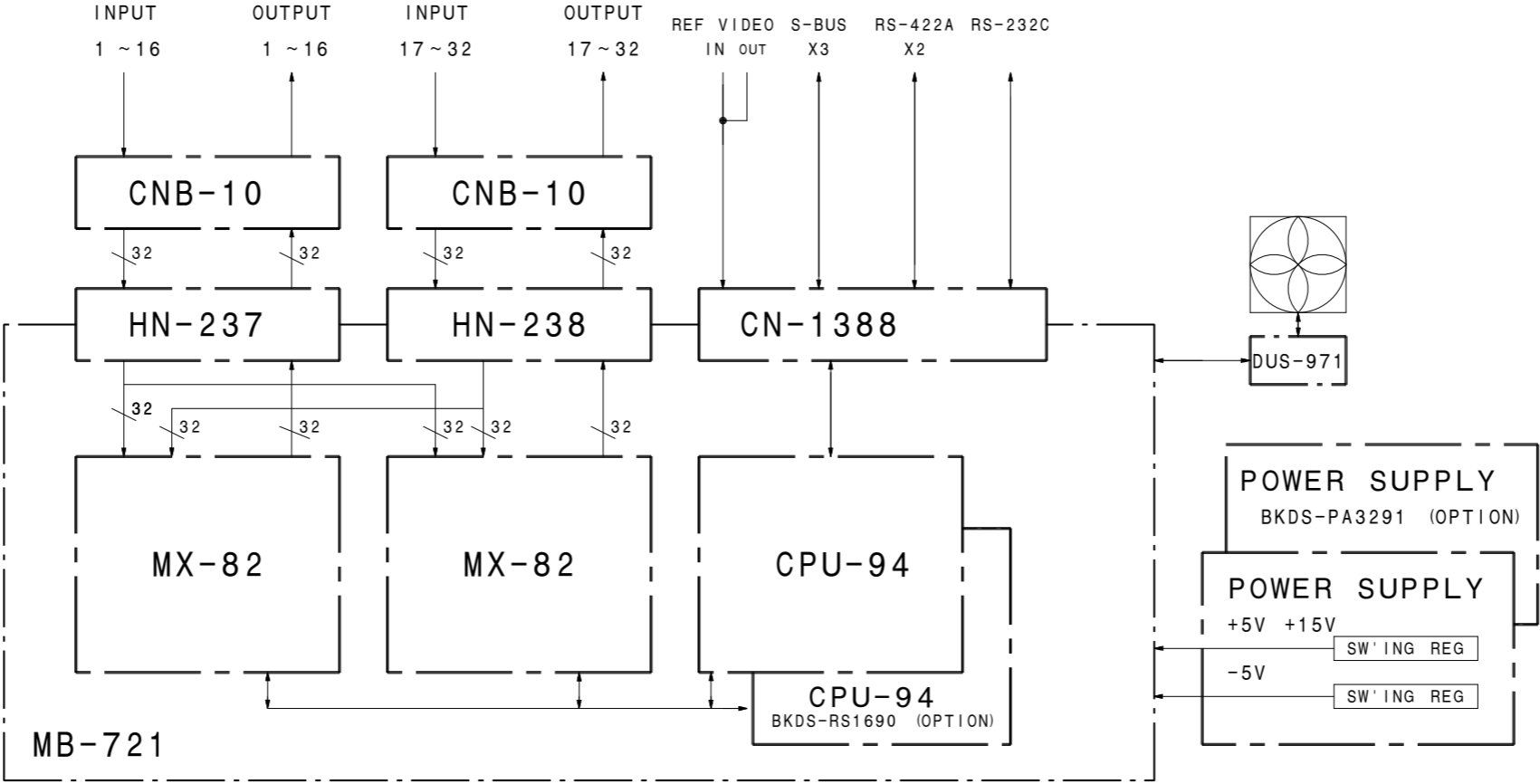
INPUTS				FUNCTION	
WR	RD	B/ \bar{A}	C/ \bar{D}		
0	1	0	0	CHANNEL A	WRITE (TxD)
		1		CHANNEL B	
1	0	0	0	CHANNEL A	READ (RxD)
		1		CHANNEL B	
0	1	0	1	CHANNEL A	WRITE (CONTROL REGISTER)
		1		CHANNEL B	
1	0	0	1	CHANNEL A	READ (STATUS REGISTER)
		1		CHANNEL B	
1	1	X	X	HIGH-IMPEDANCE	
0	0	X	X	INHIBIT	

0	; LOW LEVEL
1	; HIGH LEVEL
X	; DON'T CARE

CK	: SYSTEM CLOCK INPUT
WR	: WRITE ENABLE INPUT
RD	: READ ENABLE INPUT
B/ \overline{A}	: CHANNEL B/ \overline{A} SELECT INPUT
C/ \overline{D}	: CONTROL/DATA SELECT INPUT
D0-D7	: DATA BUS INPUTS/OUTPUTS
INT	: INTERRUPT OUTPUT
INTAK	: INTERRUPT ACKNOWLEDGE INPUT
PRI	: PRIORITY INPUT
DREQTxA	: DMA REQUEST TxA OUTPUT
DREQRxA	: DMA REQUEST RxA OUTPUT
PRO	: PRIORITY OUTPUT

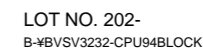
<u>DTR</u> A/DQRTx:B	: DATA TERMINAL READY A/DMA REQUEST Tx:B OUTPUT
<u>DTR</u> B/DRQRx:B	: DATA TERMINAL READY B/DMA REQUEST Rx:B OUTPUT
CTSA, CTSB	: CLEAR TO SEND A/B INPUT
DCDA, DCDB	: DATA CARRIER DETECT A/B INPUT
RTSA, RTSB	: REQUEST TO SEND A/B OUTPUT
RESET	: RESET INPUT

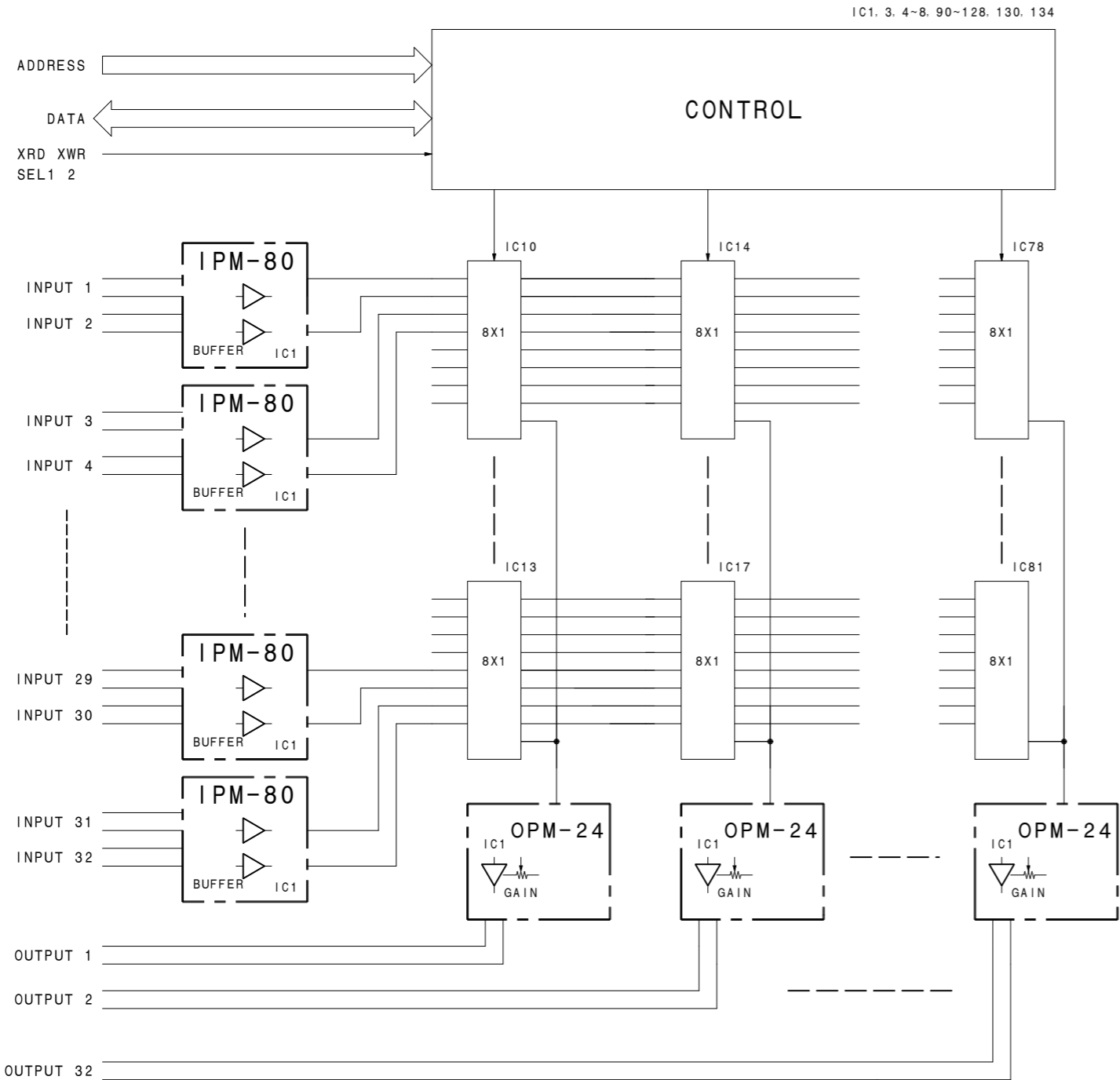
Section 7
Block Diagrams



OVERALL Block Diagram

B-VBSA3232-ALLBLOCK





MX-82 Block Diagram
LOT NO. 603-
B-BVSA3232-MXBLOCK

Section 8

Board Layouts and Locations of Components

Index

Block	Board Name	Function	Page
Front Side	CPU-94	Control Board	8-2
	MX-82	Matrix Board	8-4
	IPM-80	Input Board	8-5
	OPM-24	Output Board	8-5
Rear Side	CN-1388	Connector Board	8-6
	CNB-10	Connector Board	8-6
	HN-237	Connector Board	8-8
	HN-238	Connector Board	8-10
	MB-721	Mother Board	8-12
Power Supply Block	DP-251	LED Board	8-14
	FL-235	Filter Board	8-14
	PS-453	Power Supply Board	8-14

BKDS-PA3291 (Option)

Block	Board Name	Function	Page
Power Supply Block	DP-251	LED Board	8-14
	FL-235	Filter Board	8-14
	PS-453	Power Supply Board	8-14

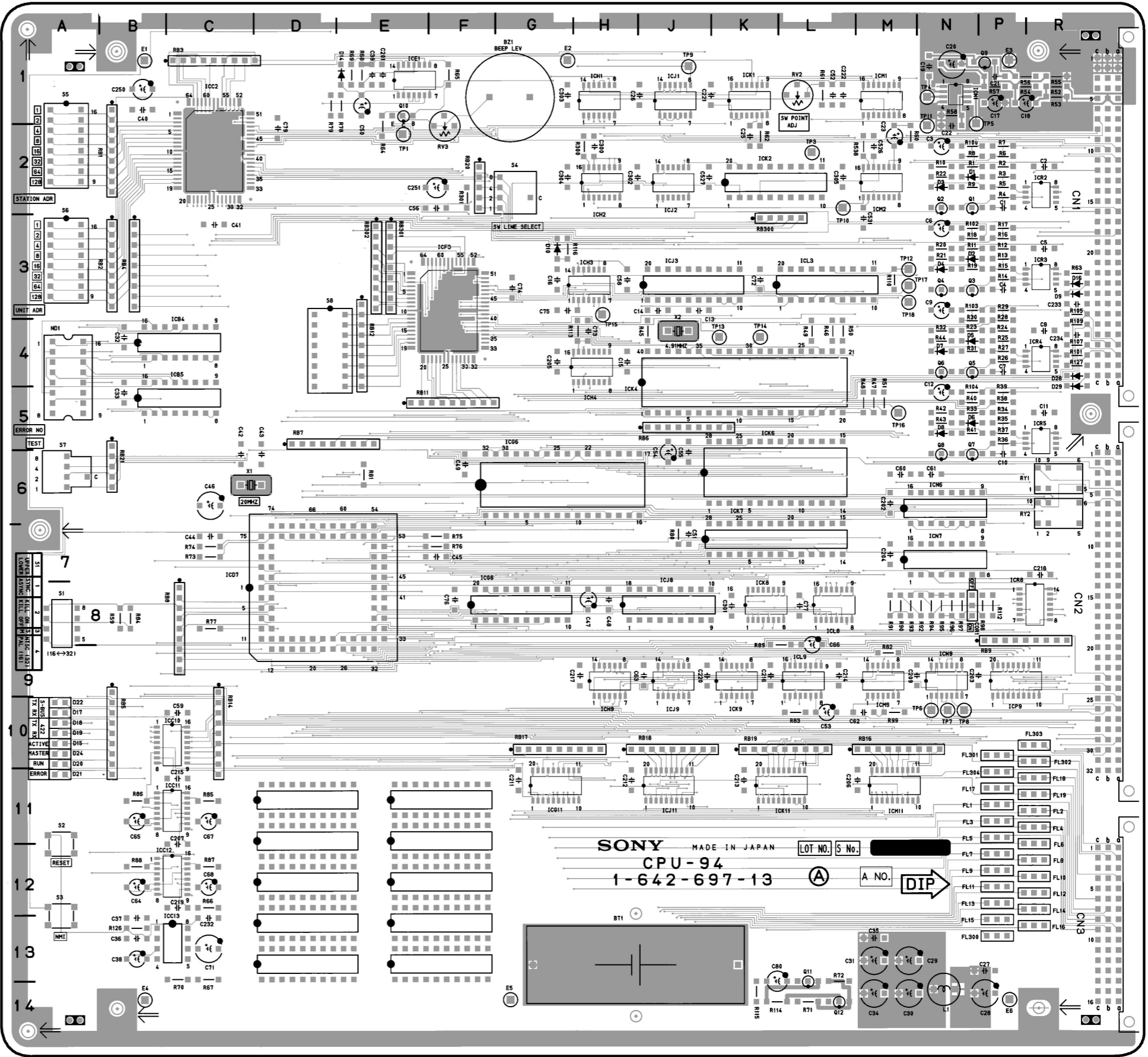
BKDS-RS1690 (Option)

Block	Board Name	Function	Page
Front	CPU-94	Control Board	8-2

CPU-94(1-642-697-13)

*: B SIDE

AD7	C7	C80	L13	ICB4	C4	RY1	R6	R89	K9
AG6	G5	C201	E1	ICB5	C4	RY2	R6	R90	M8
AG8	F7	C202	M6	ICC2	C1			R91	M8
AK2	K2	C203	N9	ICC10	C10	R1	N2	R92	N8
AK6	K5	C204	M7	ICC11	C11	R2	P2	R93	M8
AL3	L3	C205	G4	ICC12	B12	R3	P2	R94	N8
		C206	L11	ICC13	B13	R4	P2	R95	N8
BT1	H13	C207	C11	ICD7	C7	R5	P2	R96	N8
		C209	M9	ICE1	E1	R6	P2	R97	N8
BZ1	G1	C211	G11	ICF3	F3	R7	P2	R98	P8
		C212	H11	ICG6	G5	R8	N2	R99	M10
CN1	R2	C213	K11	ICG8	F7	R9	N2	R100	N2
CN2	R8	C214	L9	ICG11	G11	R10	N2	R101	R4
CN3	R13	C215	C11	ICH1	H1	R11	N3	R102	N3
		C216	K9	ICH2	H3	R12	P3	R103	N3
COR1	N8	C217	G9	ICH3	H3	R13	P3	R104	N4
		C218	R7	ICH4	H5	R14	P3	R105	R3
C1	P2	C219	C12	ICH9	H10	R15	P3	R107	R4
C2	R2	C220	J9	ICJ1	J1	R16	P3	R109	R4
C3	N2	C221	J1	ICJ2	J2	R17	P3	R110	M3
C4	P3	C222	L1	ICJ3	J3	R18	N3	R112	P8
C5	R3	C232	C13	ICJ8	J7	R19	N3	R113	G4
C6	N3	C233	R3	ICJ9	J10	R20	N3	R114	L14
C7	P4	C234	R4	ICJ11	J11	R21	N3	R115	K14
C8	R4	C250	B1	ICK1	K1	R22	N2	R116	G3
C9	N3	C251	E2	ICK2	K2	R23	N4	R126	B13
C10	P6	C300	H2	ICK4	H5	R24	P4	R127	R4
C11	R5	C301	K8	ICK6	K5	R25	P4	R300	H2
C12	N5	C302	H2	ICK7	K6	R26	P4	R301	F2
C13	J4	C303	G1	ICK8	K7	R27	P4	R538	M2
C14	H4	C304	G2	ICK9	K10	R28	P3		
C15	H4	C305	L2	ICK11	L11	R29	P3	S1	A8
C16	G3	C526	M2	ICL3	L3	R30	N3	S2	A11
C17	P1	C527	J2	ICL8	L8	R31	N4	S3	A12
C18	R1	C531	M3	ICL9	L9	R32	N4	S4	G2
C19	N1			ICM1	M1	R33	N5	S5	A1
C20	N1	D1	N2	ICM2	M2	R34	P5	S6	A2
C21	P1	D2	N3	ICM9	M10	R35	P5	S7	A5
C22	N2	D3	N2	ICM11	M11	R36	P5	S8	D3
C23	M2	D4	N3	ICN1	N1	R37	P5		
C25	K2	D5	N4	ICN6	N6	R38	P5	TP1	E2
C26	H1	D6	N5	ICN7	N7	R39	P4	TP3	L2
C27	P13	D7	N4	ICN9	N9	R40	N5	TP4	N1
C28	P14	D8	N5	ICP9	P10	R41	N5	TP5	P2
C29	N13	D9	R3	ICR2	R2	R42	N5	TP6	N10
C30	M13	D10	G3	ICR3	R3	R43	N5	TP7	N10
C31	M13	D14	E1	ICR4	R4	R44	N4	TP8	N10
C32	B4	D15	A10	ICR5	R5	R45	J4	TP9	J1
C33	B5	D16	R3	ICR8	P7	R46	L4	TP10	L3
C34	M14	D17	A10			R47	M5	TP11	N1
C35	M13	D18	A10	L1	N14	R48	M5	TP12	M3
C36	B13	D19	A10			R49	L4	TP13	K4
C37	B13	D20	A10	ND1	A4	R50	L4	TP14	K4
C38	B13	D21	A11			R51	M4	TP15	H4
C39	E1	D22	A10	Q1	N2	R52	R1	TP16	M5
C40	B1	D24	A10	Q2	N2	R53	R1	TP17	N3
C41	C3	D26	R4	Q3	N3	R54	R1	TP18	M4
C42	C5	D29	R5	Q4	N3	R55	R1		
C43	D5		Q5	N4	R4	R56	R1	X1	C6
C44	C7	E1	B1	Q6	N4	R57	P1	X2	J4
C45	F7	E2	G1	Q7	N6	R58	N1		
C46	C6	E3	P1	Q8	N6	R59	B8		
C47	H8	E4	B14	Q9	P1	R60	M2		
C48	H8	E5	G14	Q10	E1	R61	L1		
C49	F6	E6	P14	Q11	L13	R62	K2		
C50	E2			Q12	L14	R63	R3		
C51	J7	FL1	N11			R64	E2		
C52	L1	FL2	R11	RB1	A2	R65	F1		
C53	L10	FL3	N11	RB2	A3	R66	C12		
C54	J6	FL4	R11	RB3	C1	R67	C14		
C55	J6	FL5	N11	RB4	B4	R68	E1		
C56	E2	FL6	R11	RB5	B10	R69	E1		
C58	H3	FL7	N12	RB6	J5	R70	C14		
C59	C10	FL8	R12	RB7	D5	R71	L14		
C60	M6	FL9	N12	RB8	B8	R72	L13		
C61	N6	FL10	R12	RB9	P9	R73	C7		
C62	M10	FL11	N12	RB11	E5	R74	C7		
C63	H9	FL12	R12	RB12	E4	R75	F7		
C64	B12	FL13	N12	RB14	C10	R76	F7		
C65	B11	FL14	R12	RB16	M10	R77	C8		
C66	L9	FL15	N13	RB17	G10	R78	E2		
C67	C11	FL16	R13	RB18	H10	R79	D2		
C68	C12	FL17	N11	RB19	K10	R80	J7		
C71	C13	FL18	R11	RB20	F2	R81	E6		
C72	K3	FL19	R11	RB21	B6	R82	M9		
C73	H4	FL300	N13	RB300	K3	R83	L10		
C74	G3	FL301	N10	RB301	E3	R84	B8		
C75	G3	FL302	R10	RB302	E3	R85	C11		
C76	F8	FL303	R10			R86	B11		
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C79	D2			RV3	F2	R88	B12		

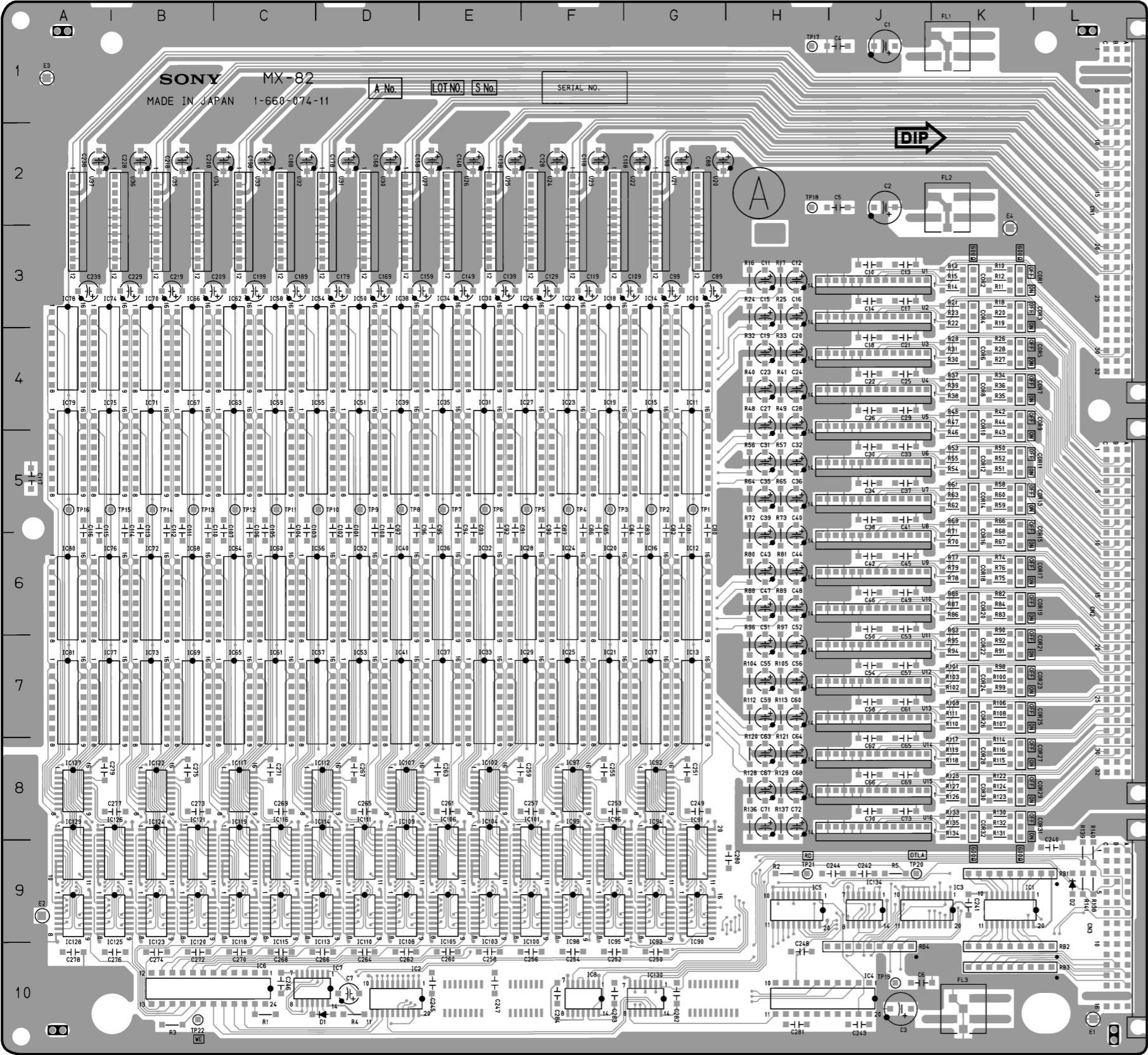




1-642-697-13

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C79	D2			RV3	F2	R88	B12

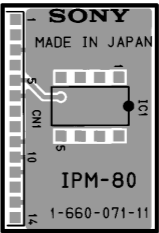
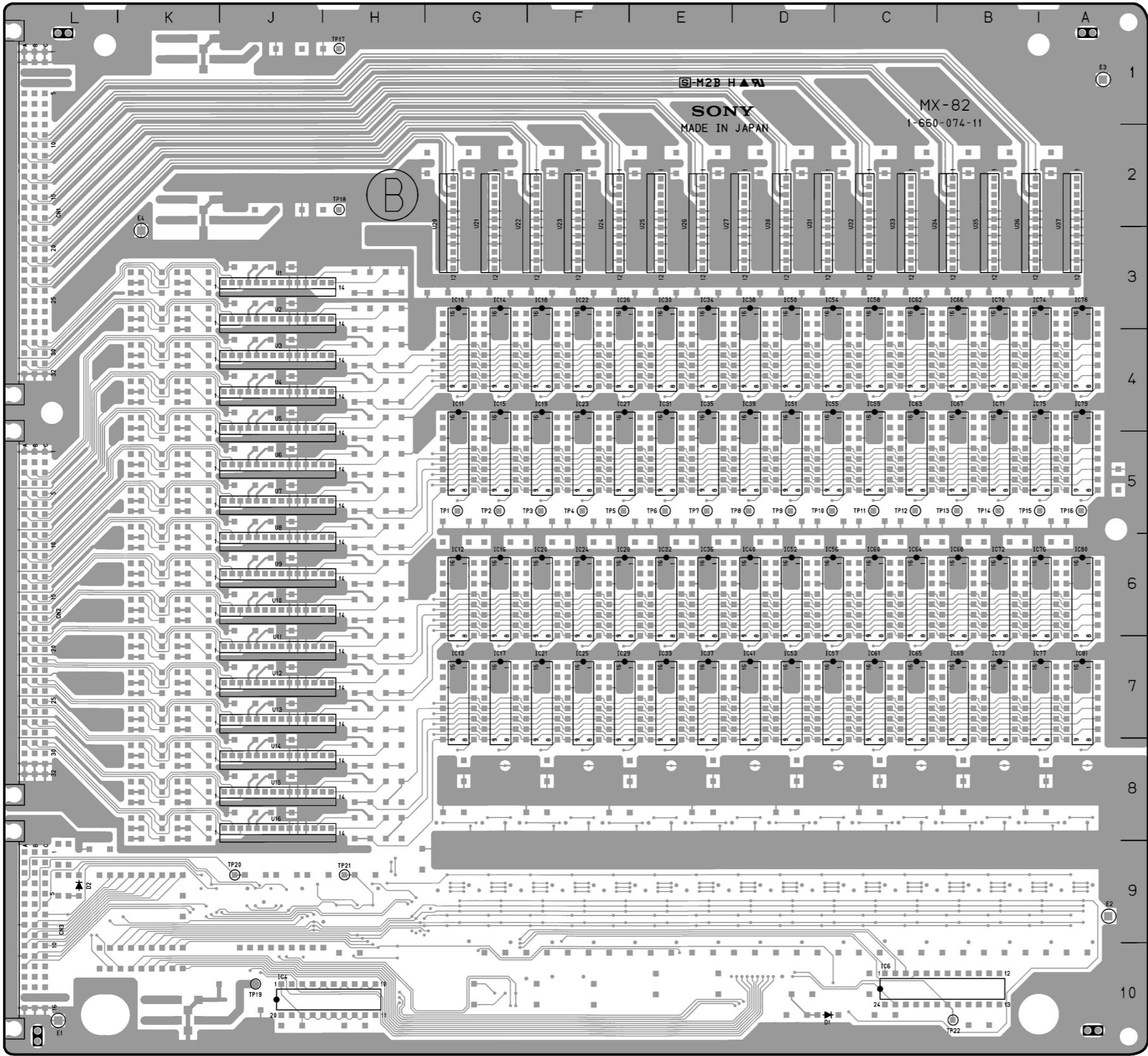


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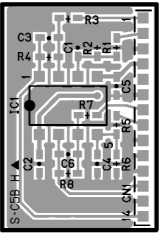
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CN1	L1	C57	J7	C250	G10	IC53	D7	R49	H4
CN2	L5	C58	J7	C251	G8	IC54	C3	R56	H5
CN3	L9	C59	H7	C252	G10	IC55	C4	R57	H5
		C60	H7	C253	G8	IC56	C6	R64	H5
COR1	K3	C61	J7	C254	F10	IC57	C7	R65	H5
COR2	K3	C62	J8	C255	F8	IC58	C3	R72	H5
COR3	K4	C63	H8	C256	F10	IC59	C4	R73	H5
COR4	K4	C64	H8	C257	F8	IC60	C6	R80	H6
COR5	K4	C65	J8	C258	E10	IC61	C7	R81	H6
COR6	K4	C66	J8	C259	E8	IC62	C3	R88	H6
COR7	K4	C67	H8	C260	E10	IC63	C4	R89	H6
COR8	K4	C68	H8	C261	E8	IC64	C6	R96	H6
COR9	K5	C69	J8	C262	D10	IC65	C7	R97	H6
COR10	K5	C70	J8	C263	E8	IC66	B3	R104	H7
COR11	K5	C71	H8	C264	D10	IC67	B4	R105	H7
COR12	K5	C72	H8	C265	D8	IC68	B6	R112	H7
COR13	K5	C73	J8	C266	D10	IC69	B7	R113	H7
COR14	K5	C80	G5	C267	D8	IC70	B3	R120	H8
COR15	K6	C81	G5	C268	C10	IC71	B4	R121	H8
COR16	K6	C82	G5	C269	C8	IC72	B6	R128	H8
COR17	K6	C83	G5	C270	C10	IC73	B7	R129	H8
COR18	K6	C84	G5	C271	C8	IC74	A3	R136	H8
COR19	K6	C85	F5	C272	B10	IC75	A4	R137	H8
COR20	K6	C86	F5	C273	B8	IC76	A6	R138	L9
COR21	K7	C87	F5	C274	B10	IC77	A7	R139	L9
COR22	K7	C88	G2	C275	B8	IC78	A3	R140	L9
COR23	K7	C89	G3	C276	B10	IC79	A4	R141	L9
COR24	K7	C90	F5	C277	B8	IC80	A6		
COR25	K7	C91	E5	C278	A10	IC81	A7	TP1	G5
COR26	K7	C92	E5	C279	A8	IC90	G9	TP2	G5
COR27	K8	C93	E5	C280	H9	IC91	G9	TP3	F5
COR28	K8	C94	E5	C281	H10	IC92	G8	TP4	F5
COR29	K8	C95	E5	C282	G10	IC93	G9	TP5	F5
COR30	K8	C96	D5	C283	F10	IC94	G9	TP6	E5
COR31	K8	C97	D5	C284	F10	IC95	F9	TP7	E5
COR32	K8	C98	G2			IC96	F9	TP8	D5
		C99	G3	D1	D10	IC97	F8	TP9	D5
C1	J1	C100	D5	D2	L9	IC98	F9	TP10	D5
C2	J2	C101	D5			IC99	F9	TP11	C5
C3	J10	C102	D5	E1	L10	IC100	F9	TP12	C5
C4	J1	C103	C5	E2	A9	IC101	F9	TP13	B5
C5	J2	C104	C5	E3	A1	IC102	E8	TP14	B5
C6	K10	C105	C5	E4	K3	IC103	E9	TP15	A5
C7	D10	C106	C5			IC104	E9	TP16	A5
C10	J3	C107	C5	FL1	K1	IC105	E9	TP17	H1
C11	H3	C108	G2	FL2	K2	IC106	E9	TP18	H2
C12	H3	C109	G3	FL3	K10	IC107	D8	TP19	J10
C13	J3	C110	B5			IC108	D9	TP20	J9
C14	J3	C111	B5	IC1	K9	IC109	D9	TP21	H9
C15	H3	C112	B5	IC2	D10	IC110	D9	TP22	B10
C16	H3	C113	B5	IC3	J9	IC111	D9		
C17	J3	C114	B5	IC4	J10	IC112	D8		
C18	J4	C115	A5	IC5	H9	IC113	D9		
C19	H4	C116	A5	IC6	C10	IC114	D9		
C20	H4	C117	A5	IC7	C10	IC115	C9		
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C22	J4	C119	F3	IC10	G3	IC117	C8		
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C24	H4	C121	F3	IC12	G6	IC119	C9		
C25	J4	C122	E2	IC13	G7	IC120	B9		
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C27	H4	C124	E2	IC15	G4	IC122	B8		
C28	H4	C125	E3	IC16	G6	IC123	B9		
C29	J4	C126	E2	IC17	G7	IC124	B9		
C30	J5	C127	E3	IC18	F3	IC125	B9		
C31	H5	C128	D2	IC19	F4	IC126	B9		
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C35	H5	C132	C2	IC23	F4	IC130	G10		
C36	H5	C133	C3	IC24	F6	IC131	J9		
C37	J5	C134	C2	IC25	F7				
C38	J5	C135	C3	IC26	E3	RB1	L9		
C39	H5	C136	C2	IC27	E4	RB2	L10		
C40	H5	C137	C3	IC28	E6	RB3	L10		
C41	J5	C138	B2	IC29	E7	RB4	J10		
C42	J6	C139	B3	IC30	E3				
C43	H6	C140	B2	IC31	E4	R1	C10		
C44	H6	C141	B3	IC32	E6	R2	H9		
C45	J6	C142	A2	IC33	E7	R3	B10		
C46	J6	C143	A3	IC34	E3	R4	D10		
C47	H6	C144	L9	IC35	E4	R5	J9		
C48	H6	C145	K9	IC36	E6	R16	H3		
C49	J6	C146	J9	IC37	E7	R17	H3		
C50	J6	C147	J10	IC38	D3	R24	H3		
C51	H6	C148	J9	IC39	D4	R25	H3		
C52	H6	C149	E10	IC40	D6	R32	H4		
C53	J6	C150	C10	IC41	D7	R33	H4		
C54	J7	C151	E10	IC42	D3	R40	H4		
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C56	H7	C153	G8	IC44	D6	R48	H4		

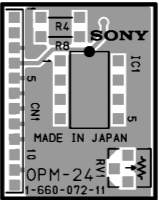
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1-660-074-11



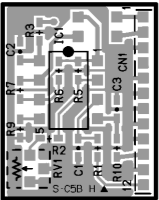
IPM-80 -A SIDE-
1-660-071-11



IPM-80 -B SIDE-
1-660-071-11

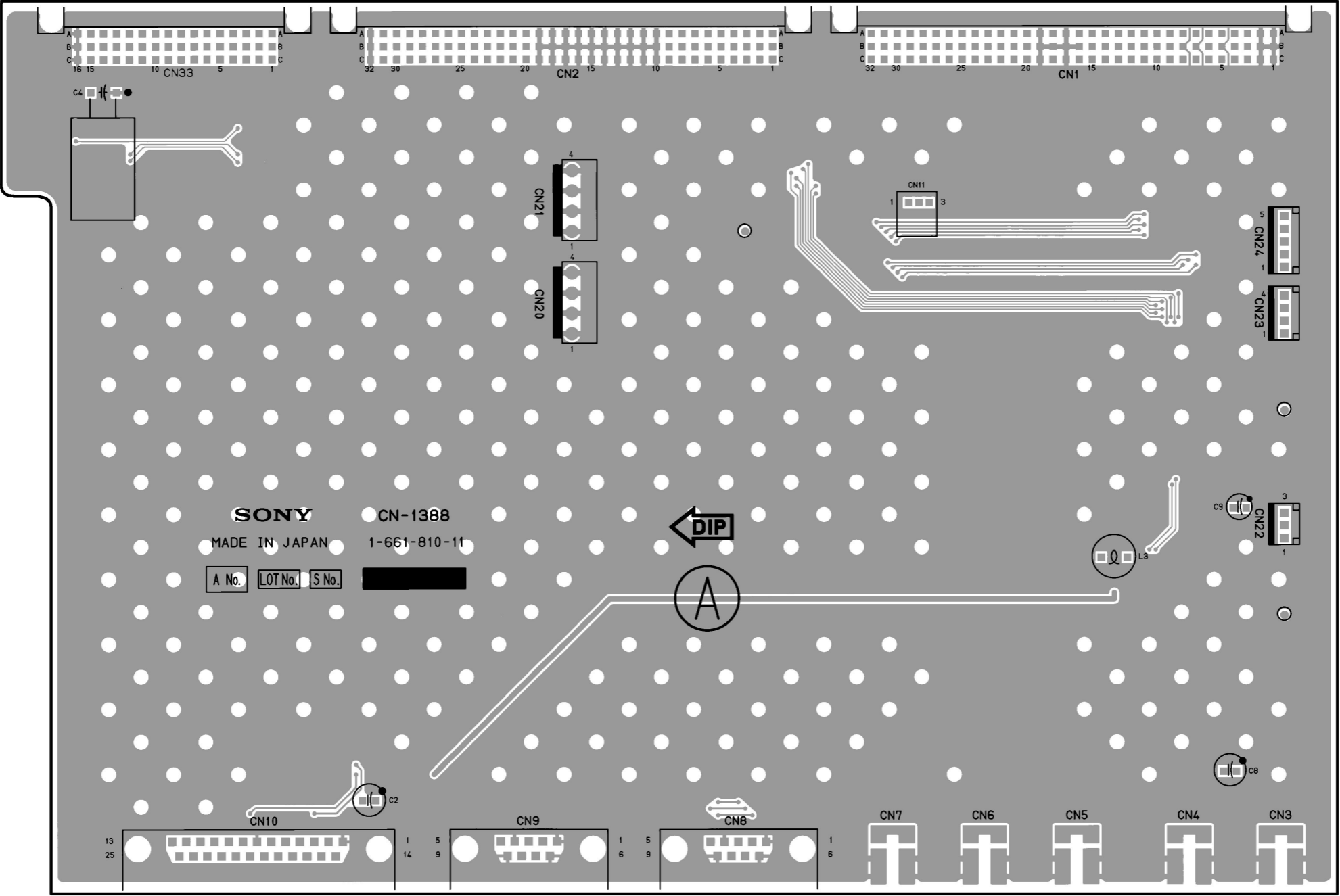


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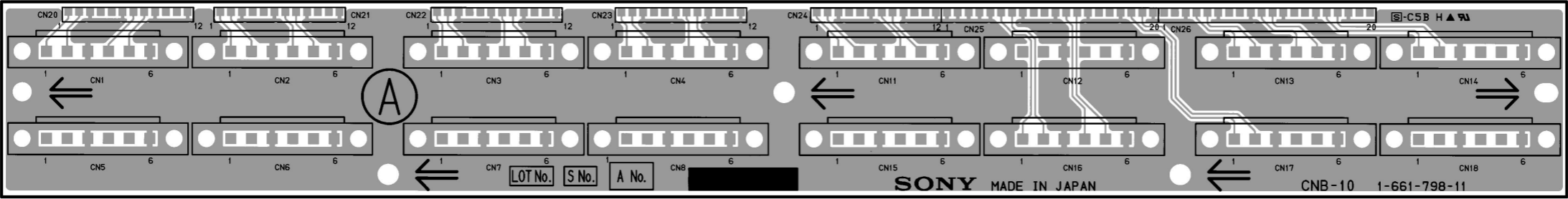


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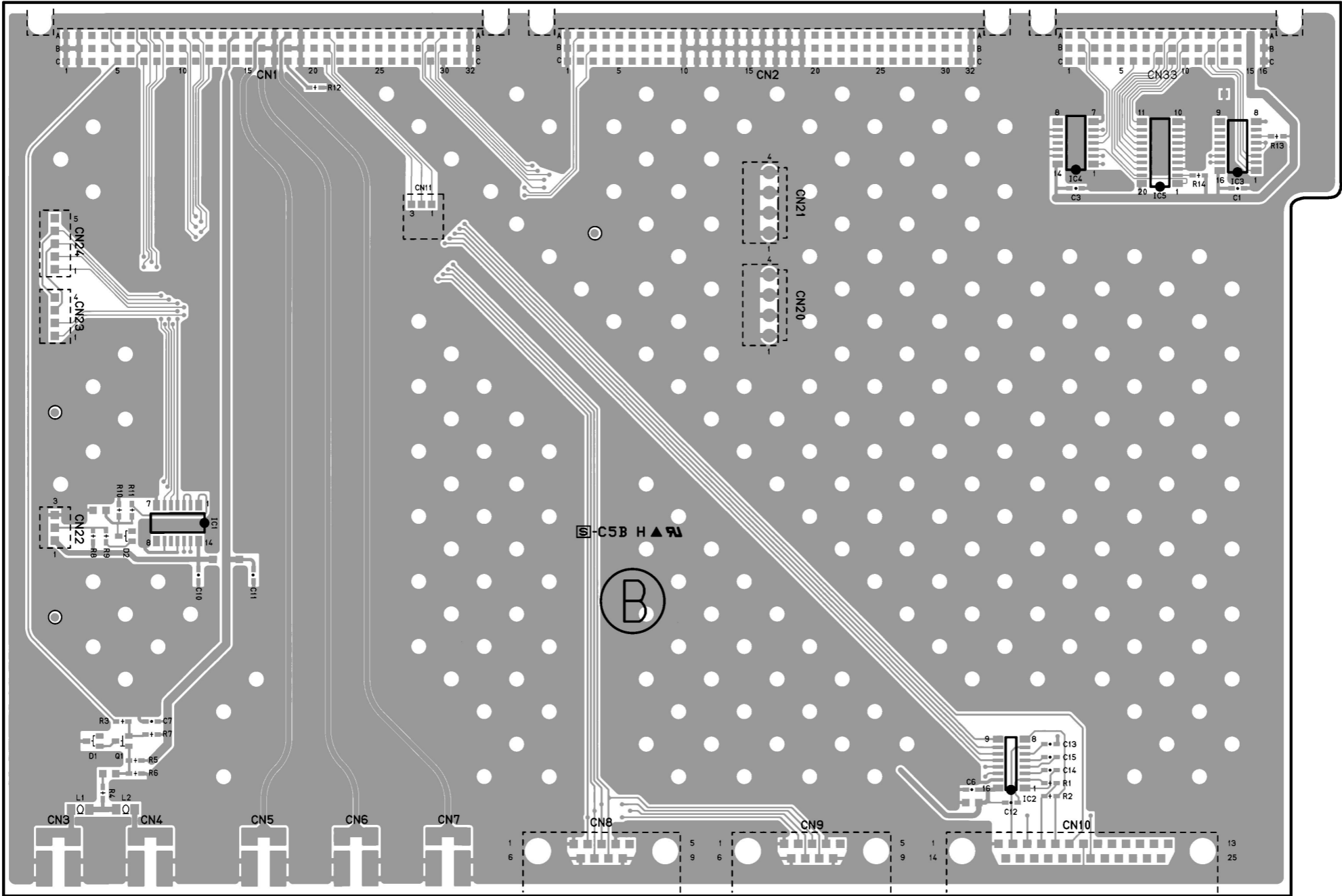
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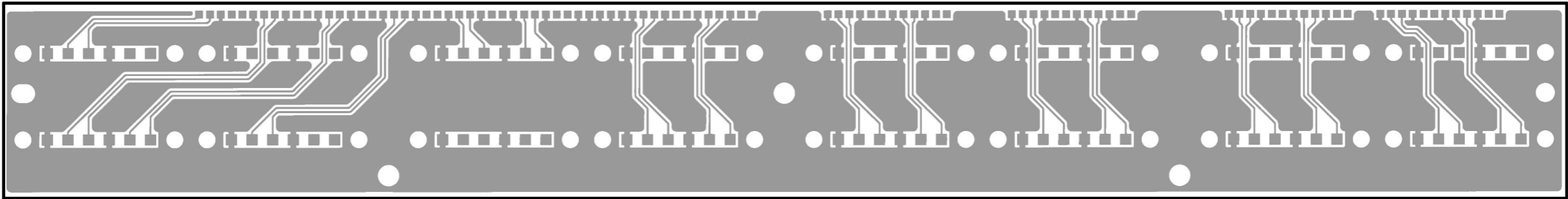
CN-1388 -A SIDE-
1-661-810-11



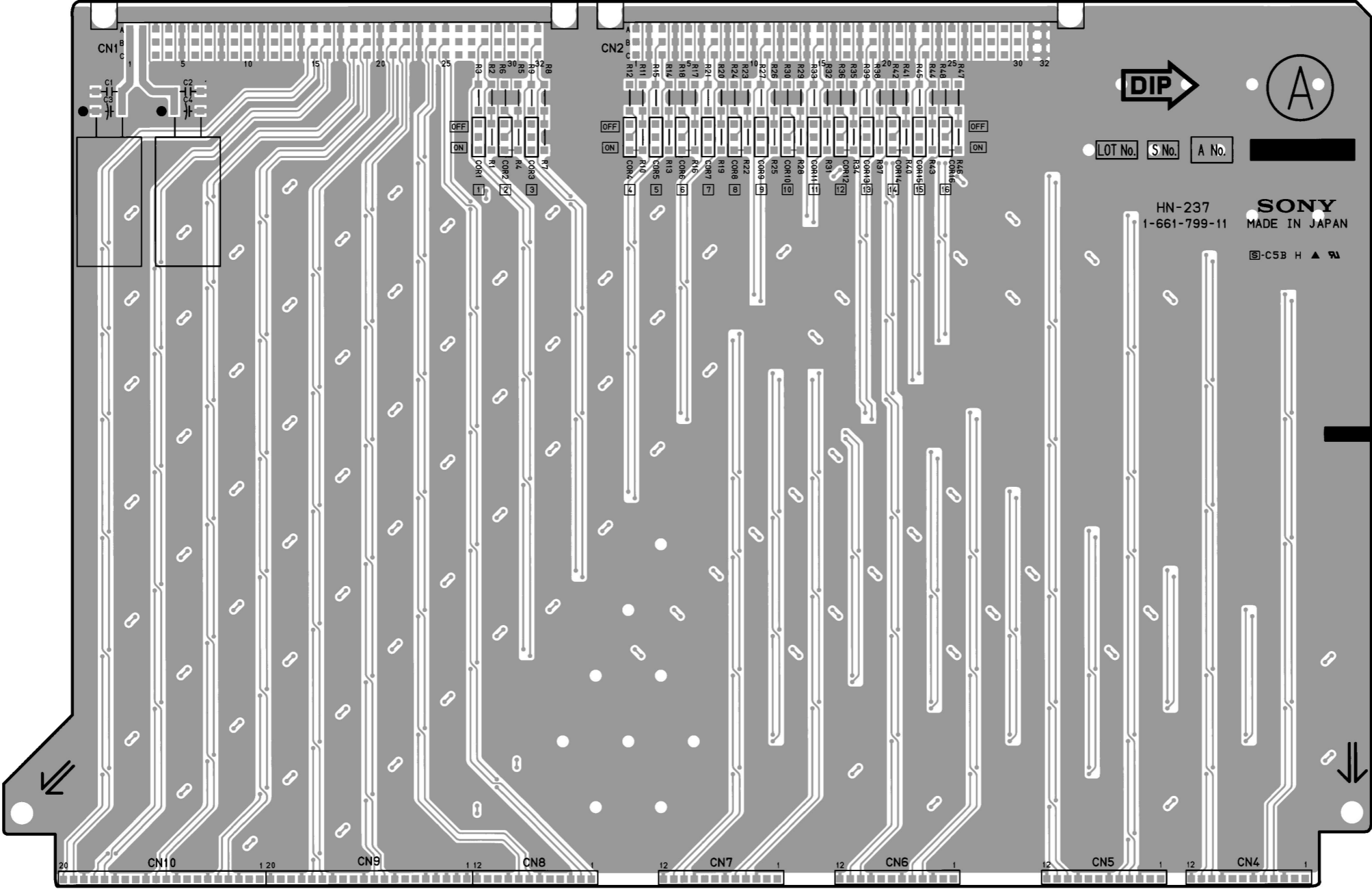
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1-661-798-11



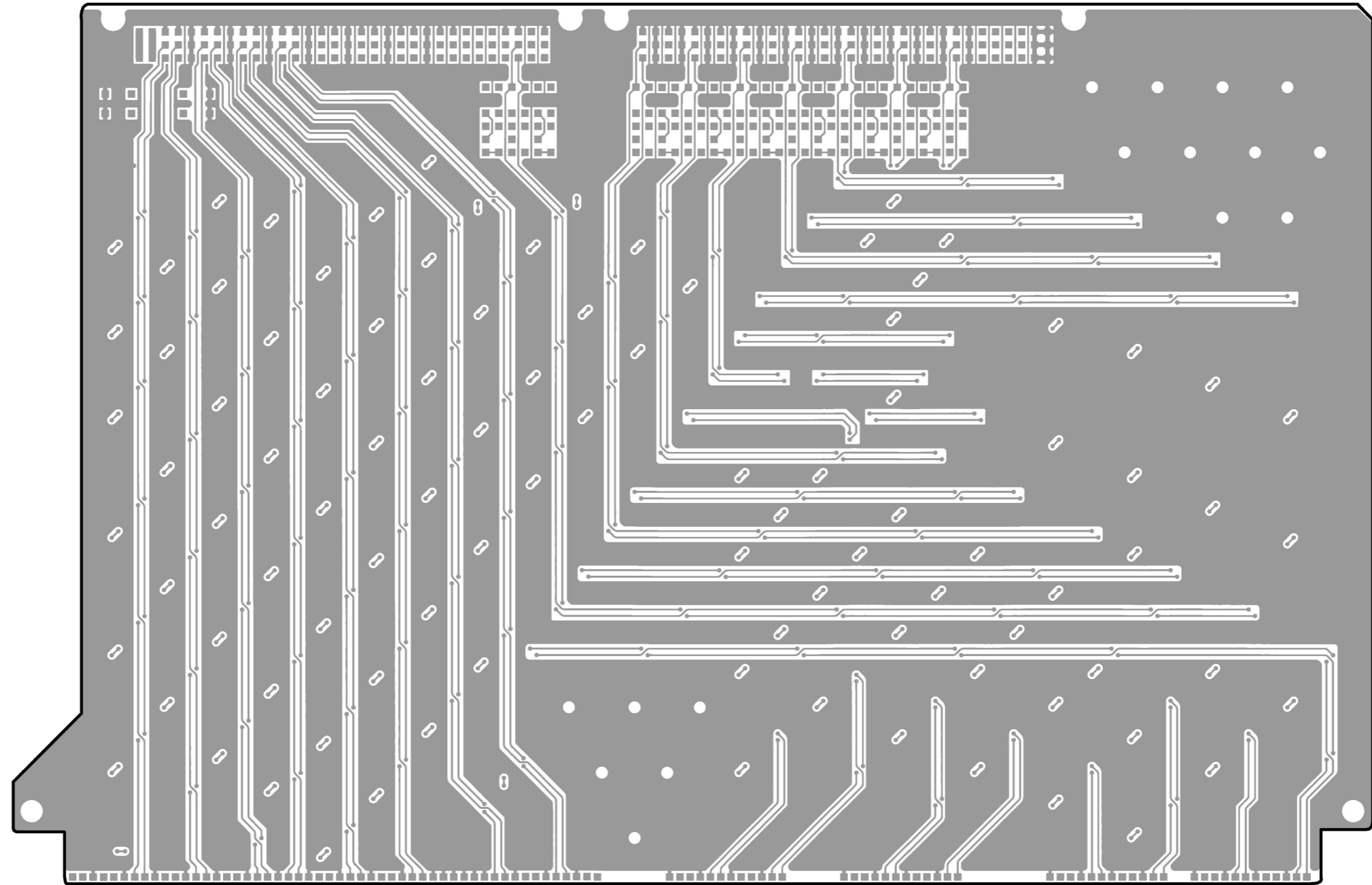
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1-661-810-11



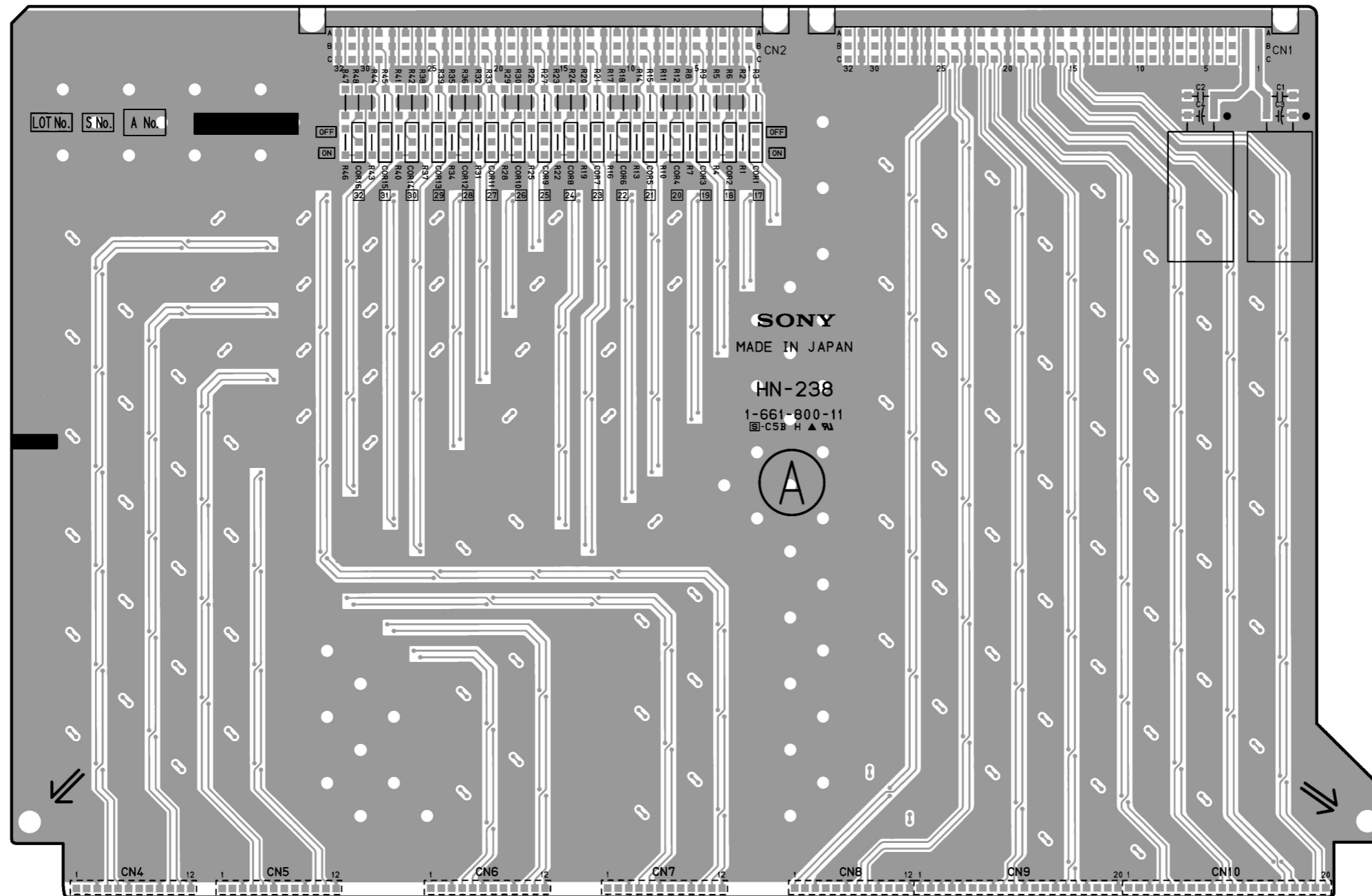
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1-661-798-11



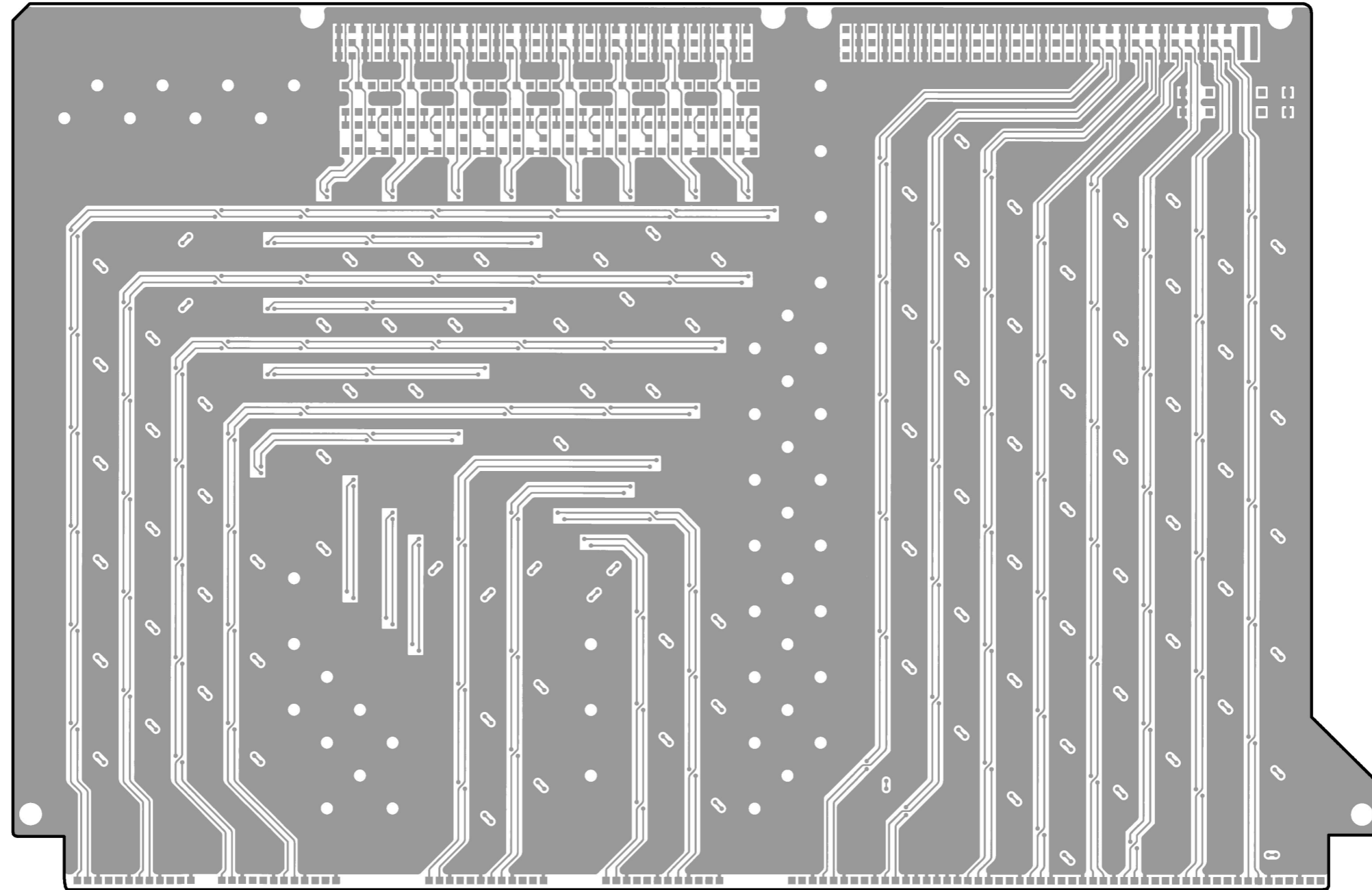
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1-661-799-11



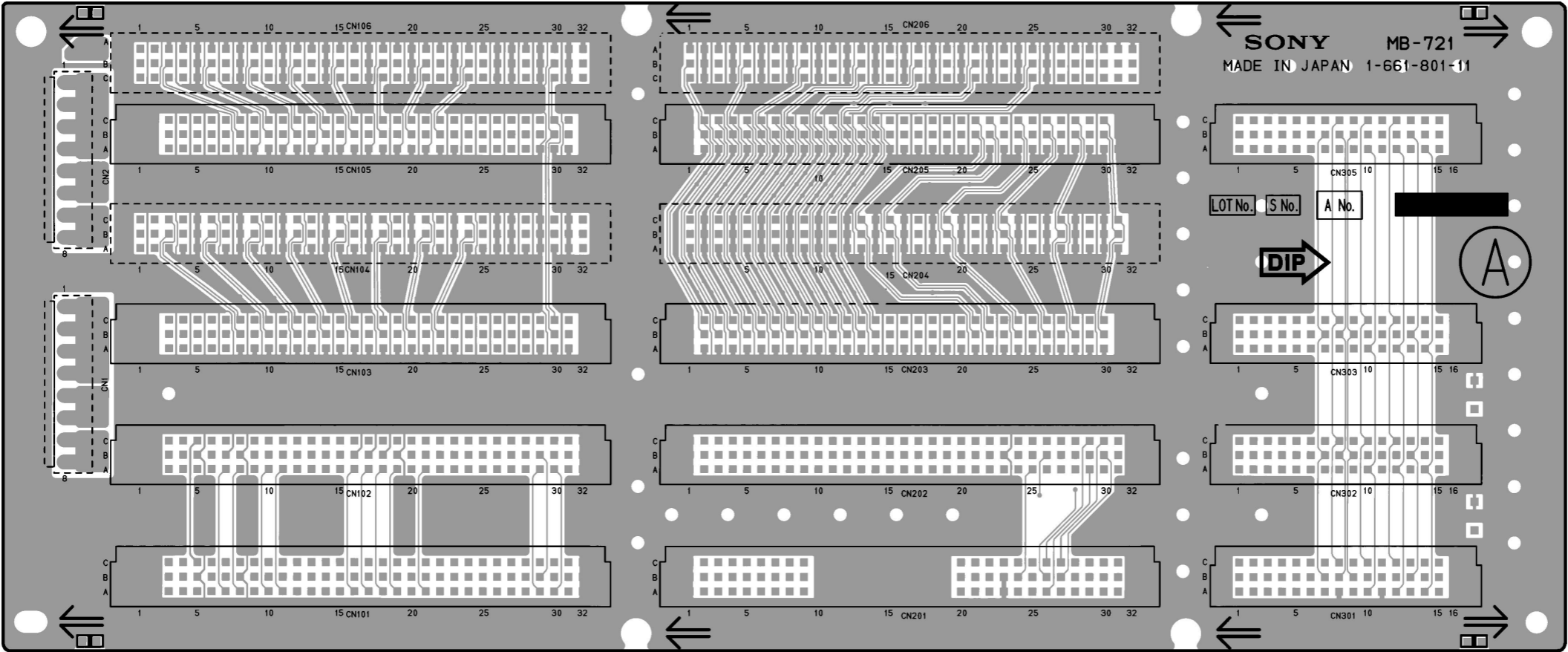
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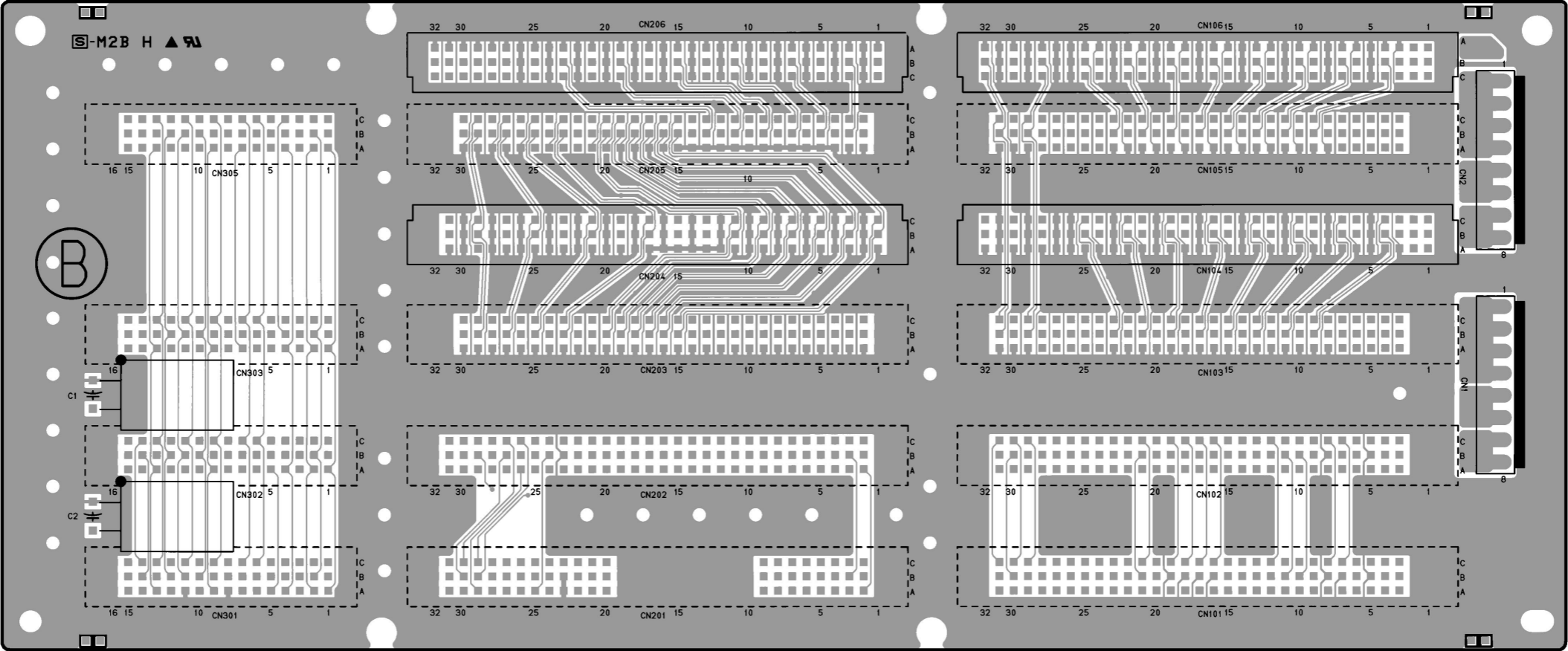
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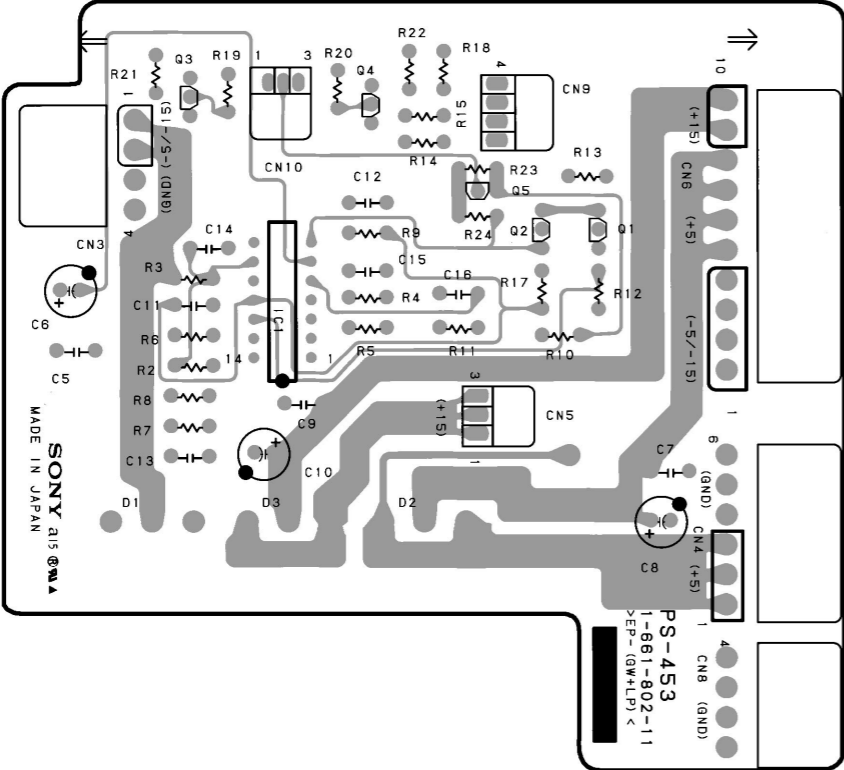
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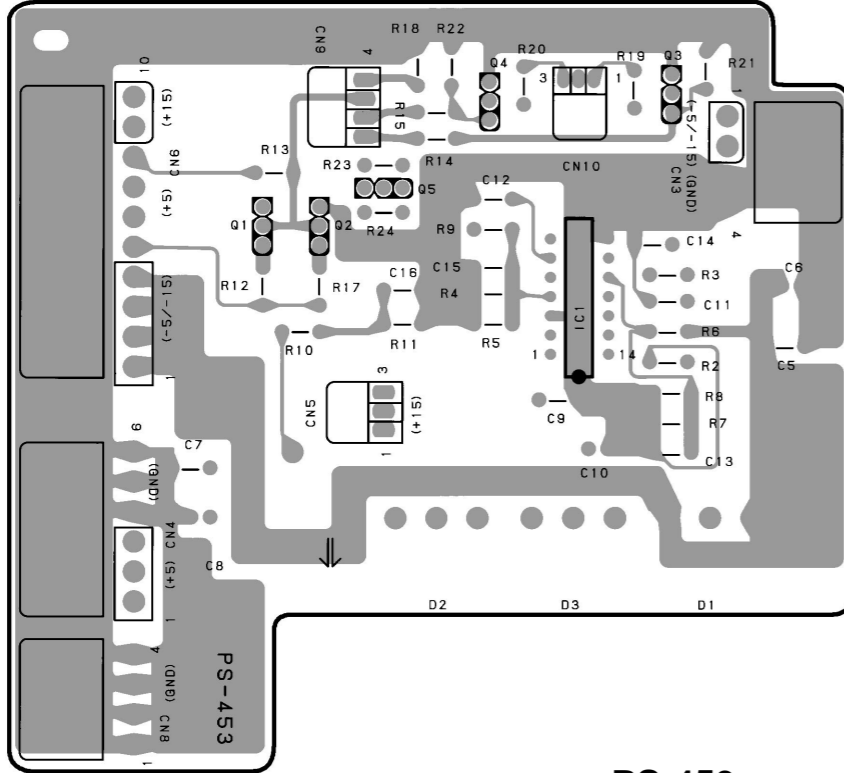
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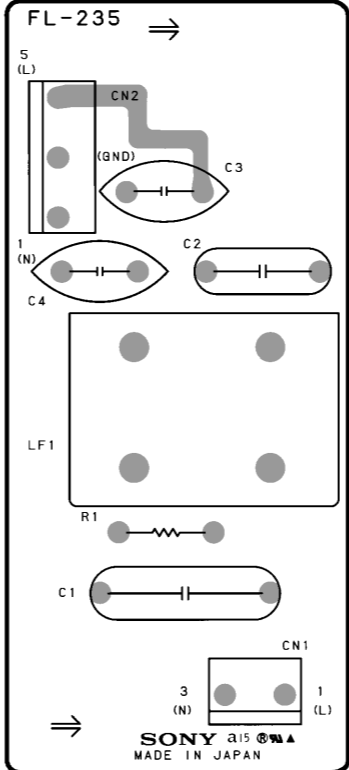
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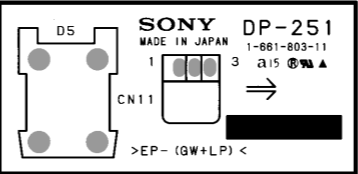
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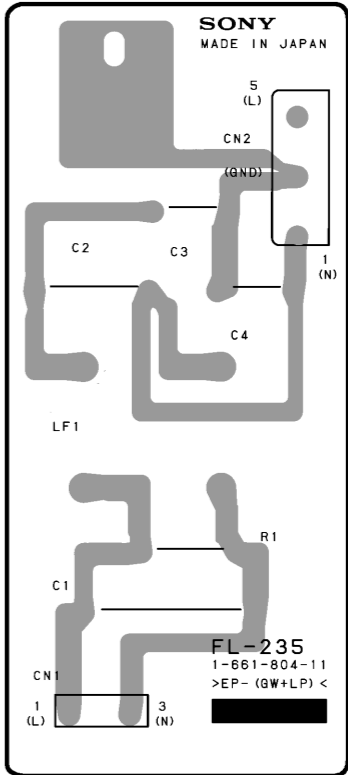
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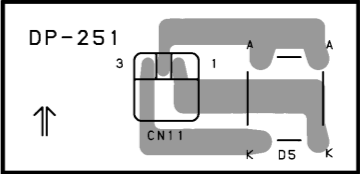
FL-235 -A SIDE-
1-661-804-11



DP-251 -A SIDE-
1-661-803-11



FL-235 -B SIDE-
1-661-804-11



DP-251 -B SIDE-
1-661-803-11

Section 9

Schematic Diagrams

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BKDS-PA3291 (Option)

Block	Board Name	Function	Page
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BKDS-RS1690 (Option)

Block	Board Name	Function	Page
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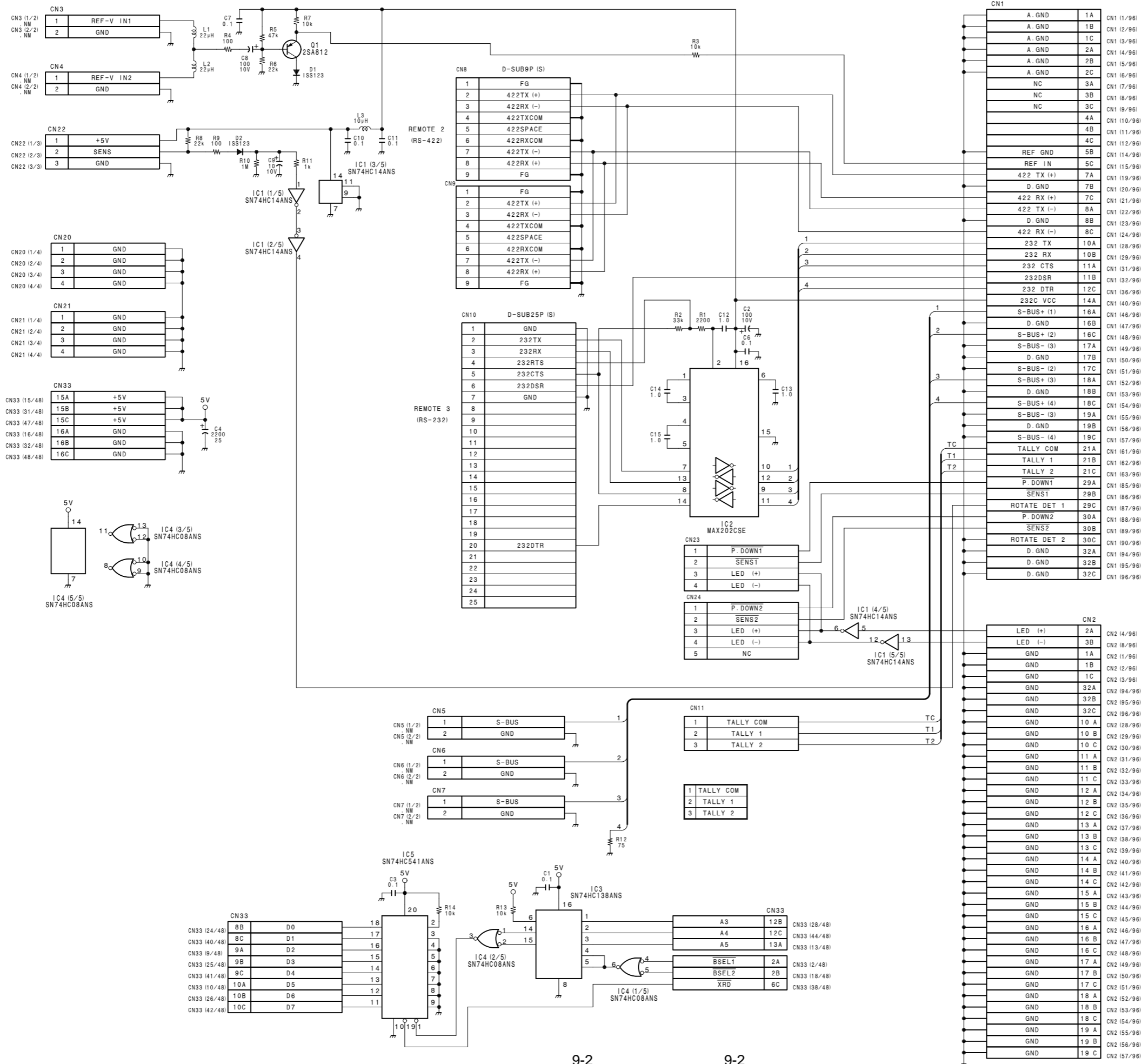
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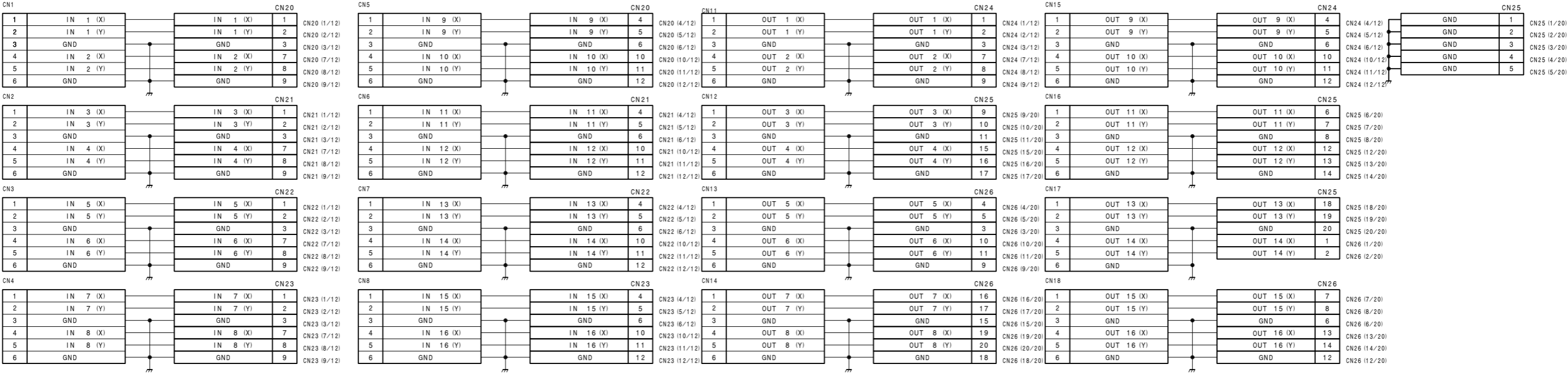
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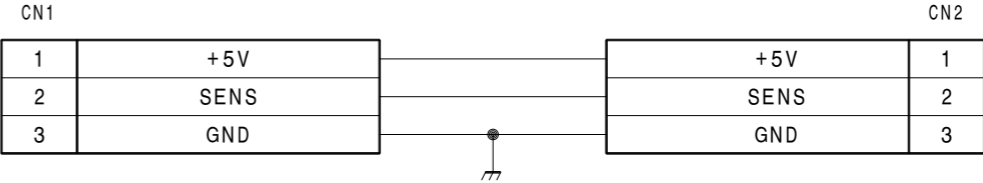
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CNB-10
BOARD NO. 1-661-798-11
LOT NO. 603-
B-#BVS3232-CNB10



DUS-971
BOARD NO. 1-661-811-11
LOT NO. 603-
B-#BVS3232-DUS971

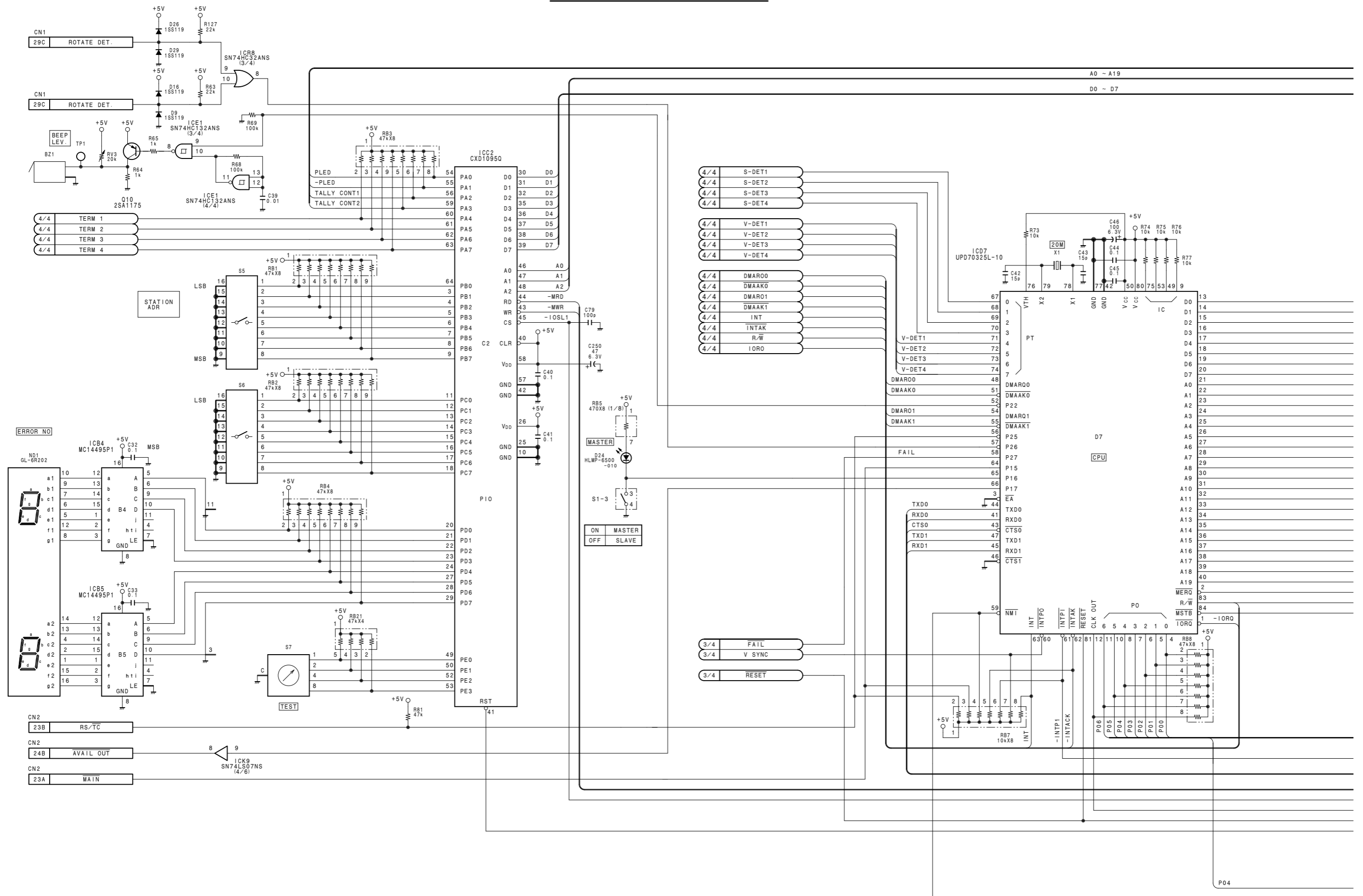
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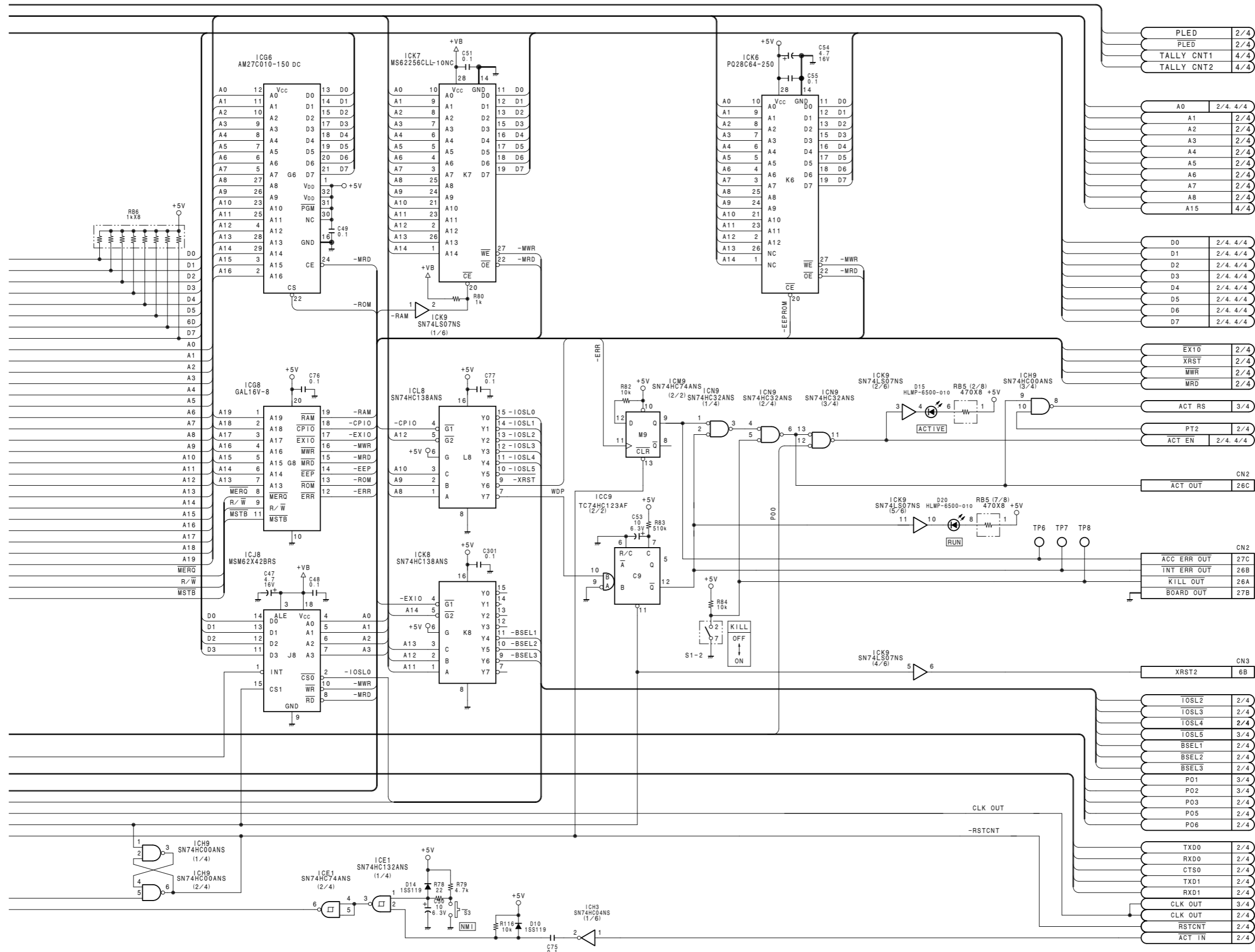
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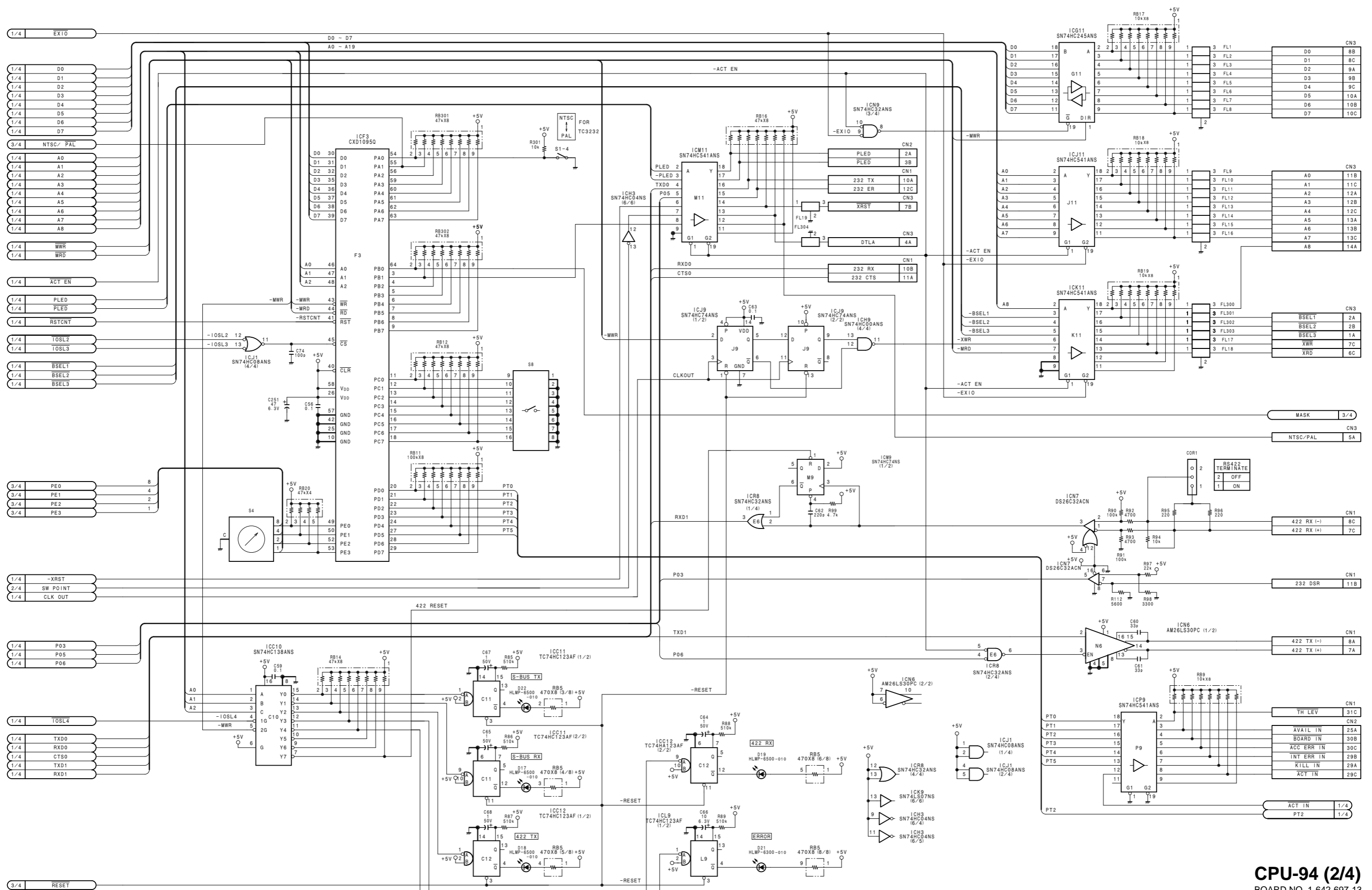
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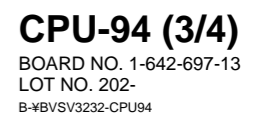
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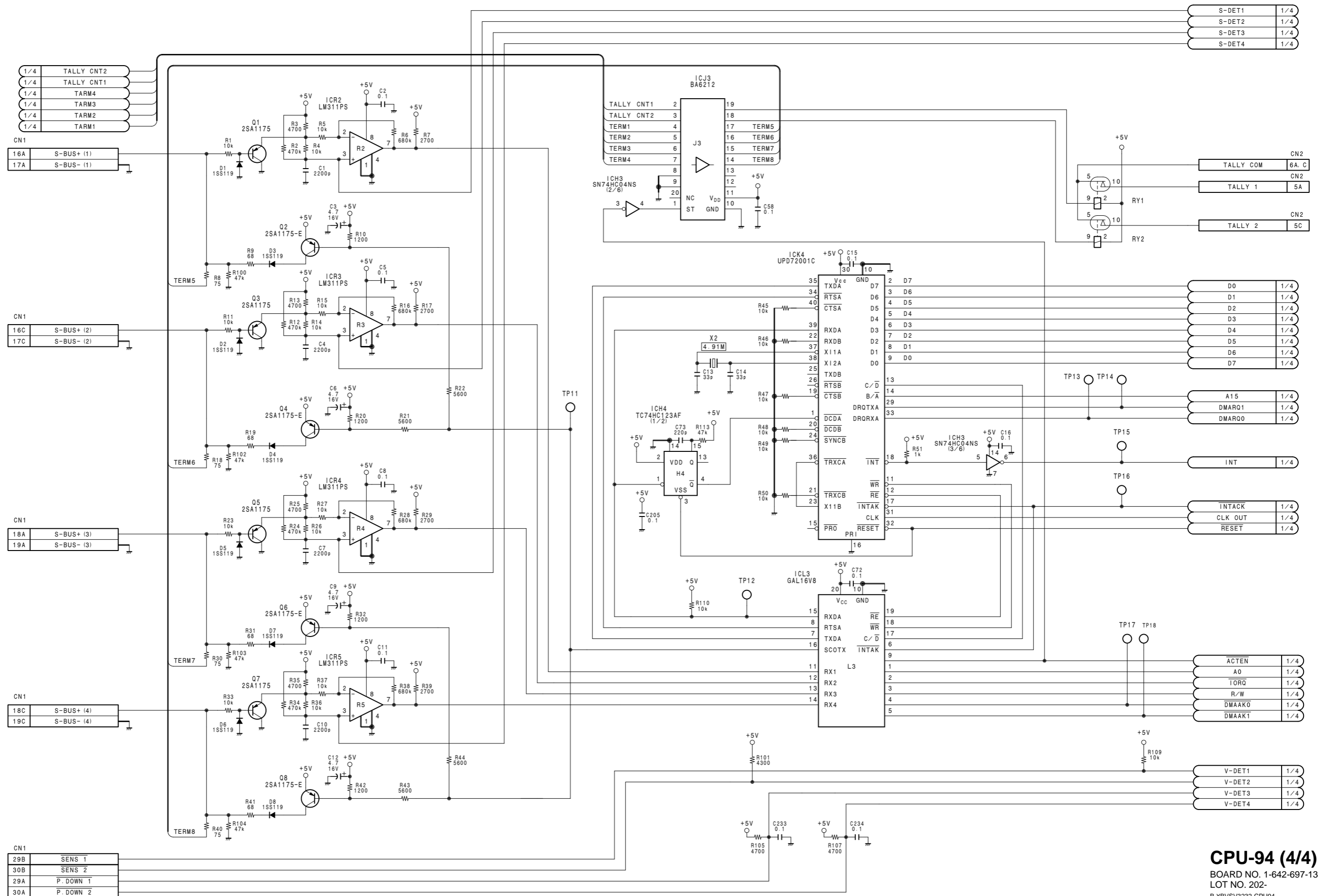




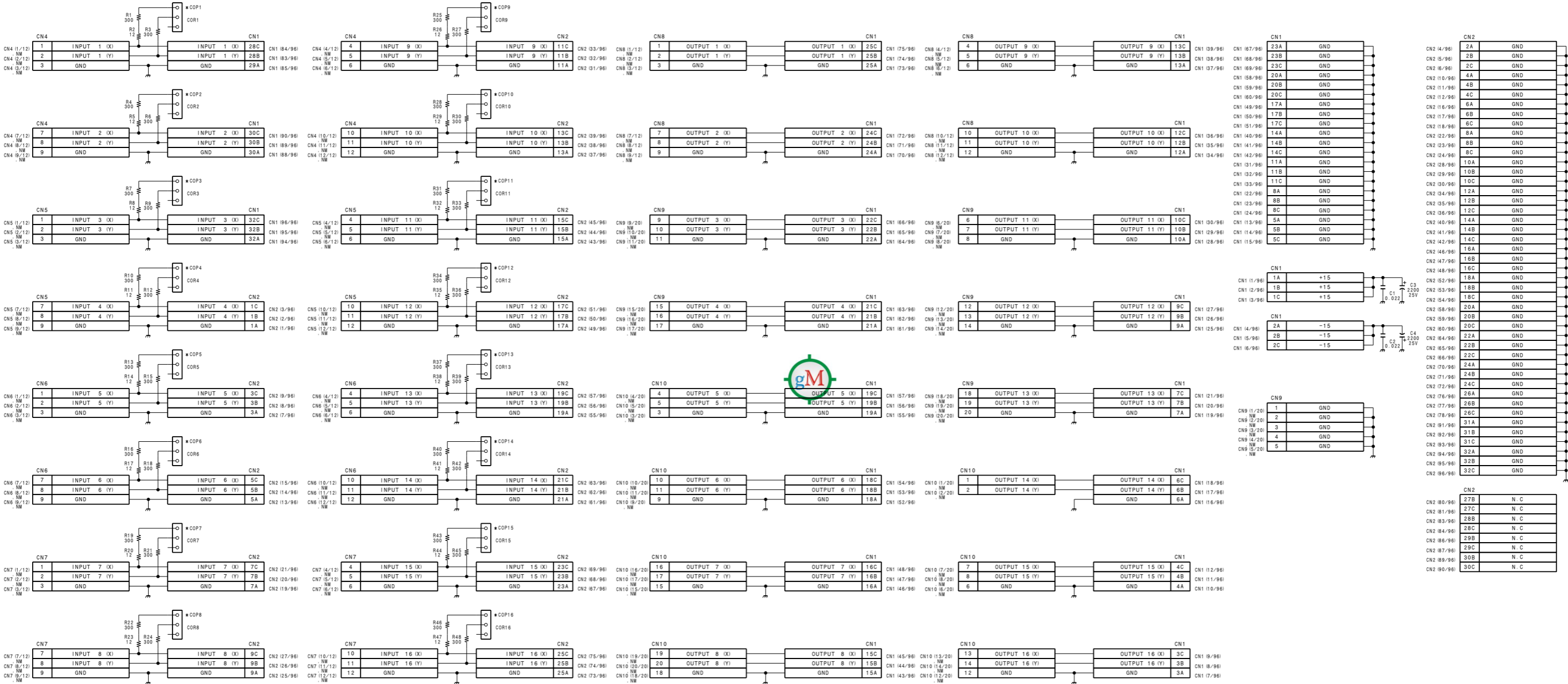
CPU-94 (2/4)
BOARD NO. 1-642-697-13
LOT NO. 202-
B-¥BVS3232-CPU94



5



1



5

HN-237
BOARD NO. 1-661-799-11
LOT NO. 603-
B-WVSA3232-HN237



MB-721

MB-721

CNS106			
NO.	A	B	C
1	+15V	+15V	+15V
2	-15V	-15V	-15V
3	GND	OUT 16 (Y)	OUT 16 (X)
4	GND	OUT 15 (Y)	OUT 15 (X)
5	GND	GND	GND
6	GND	OUT 14 (Y)	OUT 14 (X)
7	GND	OUT 13 (Y)	OUT 13 (X)
8	GND	GND	GND
9	GND	OUT 12 (Y)	OUT 12 (X)
10	GND	OUT 11 (Y)	OUT 11 (X)
11	GND	GND	GND
12	GND	OUT 10 (Y)	OUT 10 (X)
13	GND	OUT 9 (Y)	OUT 9 (X)
14	GND	GND	GND
15	GND	OUT 8 (Y)	OUT 8 (X)
16	GND	OUT 7 (Y)	OUT 7 (X)
17	GND	GND	GND
18	GND	OUT 6 (Y)	OUT 6 (X)
19	GND	OUT 5 (Y)	OUT 5 (X)
20	GND	GND	GND
21	GND	OUT 4 (Y)	OUT 4 (X)
22	GND	OUT 3 (Y)	OUT 3 (X)
23	GND	GND	GND
24	GND	OUT 2 (Y)	OUT 2 (X)
25	GND	OUT 1 (Y)	OUT 1 (X)
26	GND	GND	GND
27	GND	GND	GND
28	GND	IN 1 (Y)	IN 1 (X)
29	GND	GND	GND
30	GND	IN 2 (Y)	IN 2 (X)
31	GND	GND	GND
32	GND	IN 3 (Y)	IN 3 (X)

CNS105			
NO.	A	B	C
1	GND	GND	GND
2	GND	GND	GND
3	+15V	+5V	+15V
4	-15V	-5V	-15V
5			
6			
7			
8	GND	OUT 16 (Y)	OUT 16 (X)
9	GND	OUT 15 (Y)	OUT 15 (X)
10	GND	OUT 14 (Y)	OUT 14 (X)
11	GND	OUT 13 (Y)	OUT 13 (X)
12	GND	OUT 12 (Y)	OUT 12 (X)
13	GND	OUT 11 (Y)	OUT 11 (X)
14	GND	OUT 10 (Y)	OUT 10 (X)
15	GND	OUT 9 (Y)	OUT 9 (X)
16	GND	OUT 8 (Y)	OUT 8 (X)
17	GND	OUT 7 (Y)	OUT 7 (X)
18	GND	OUT 6 (Y)	OUT 6 (X)
19	GND	OUT 5 (Y)	OUT 5 (X)
20	GND	OUT 4 (Y)	OUT 4 (X)
21	GND	OUT 3 (Y)	OUT 3 (X)
22	GND	OUT 2 (Y)	OUT 2 (X)
23	GND	OUT 1 (Y)	OUT 1 (X)
24			
25			
26			
27			
28			
29	GND	IN 1 (Y)	IN 1 (X)
30	GND	IN 2 (Y)	IN 2 (X)
31	GND	IN 3 (Y)	IN 3 (X)
32	GND	GND	GND

CNS104			
NO.	A	B	C
1	+15V	+15V	+15V
2	-15V	-15V	-15V
3	GND	OUT 32 (Y)	OUT 32 (X)
4	GND	OUT 31 (Y)	OUT 31 (X)
5	GND	GND	GND
6	GND	OUT 30 (Y)	OUT 30 (X)
7	GND	OUT 29 (Y)	OUT 29 (X)
8	GND	GND	GND
9	GND	OUT 28 (Y)	OUT 28 (X)
10	GND	OUT 27 (Y)	OUT 27 (X)
11	GND	GND	GND
12	GND	OUT 26 (Y)	OUT 26 (X)
13	GND	OUT 25 (Y)	OUT 25 (X)
14	GND	GND	GND
15	GND	OUT 24 (Y)	OUT 24 (X)
16	GND	OUT 23 (Y)	OUT 23 (X)
17	GND	GND	GND
18	GND	OUT 22 (Y)	OUT 22 (X)
19	GND	OUT 21 (Y)	OUT 21 (X)
20	GND	GND	GND
21	GND	OUT 20 (Y)	OUT 20 (X)
22	GND	OUT 19 (Y)	OUT 19 (X)
23	GND	GND	GND
24	GND	OUT 18 (Y)	OUT 18 (X)
25	GND	OUT 17 (Y)	OUT 17 (X)
26	GND	GND	GND
27	GND	GND	GND
28	GND		
29	GND	GND	GND
30	GND		
31	GND	GND	GND
32	GND		

CNS206			
NO.	A	B	C
1	GND	IN 4 (Y)	IN 4 (X)
2	GND	GND	GND
3	GND	IN 5 (Y)	IN 5 (X)
4	GND	GND	GND
5	GND	IN 6 (Y)	IN 6 (X)
6	GND	GND	GND
7	GND	IN 7 (Y)	IN 7 (X)
8	GND	GND	GND
9	GND	IN 8 (Y)	IN 8 (X)
10	GND	GND	GND
11	GND	IN 9 (Y)	IN 9 (X)
12	GND	GND	GND
13	GND	IN 10 (Y)	IN 10 (X)
14	GND	GND	GND
15	GND	IN 11 (Y)	IN 11 (X)
16	GND	GND	GND
17	GND	IN 12 (Y)	IN 12 (X)
18	GND	GND	GND
19	GND	IN 13 (Y)	IN 13 (X)
20	GND	GND	GND
21	GND	IN 14 (Y)	IN 14 (X)
22	GND	GND	GND
23	GND	IN 15 (Y)	IN 15 (X)
24	GND	GND	GND
25	GND	IN 16 (Y)	IN 16 (X)
26	GND	GND	GND
27	GND		
28	GND		
29	GND		
30	GND		
31	GND		
32	GND		

CNS205			
NO.	A	B	C
1	GND	GND	GND
2	GND	IN 4 (Y)	IN 4 (X)
3	GND	IN 5 (Y)	IN 5 (X)
4	GND	IN 6 (Y)	IN 6 (X)
5	GND	IN 7 (Y)	IN 7 (X)
6	GND	IN 8 (Y)	IN 8 (X)
7	GND	IN 9 (Y)	IN 9 (X)
8	GND	IN 10 (Y)	IN 10 (X)
9	GND	IN 11 (Y)	IN 11 (X)
10	GND	IN 12 (Y)	IN 12 (X)
11	GND	IN 13 (Y)	IN 13 (X)
12	GND	IN 14 (Y)	IN 14 (X)
13	GND	IN 15 (Y)	IN 15 (X)
14	GND	IN 16 (Y)	IN 16 (X)
15	GND	IN 17 (Y)	IN 17 (X)
16	GND	IN 18 (Y)	IN 18 (X)
17	GND	IN 19 (Y)	IN 19 (X)
18	GND	IN 20 (Y)	IN 20 (X)
19	GND	IN 21 (Y)	IN 21 (X)
20	GND	IN 22 (Y)	IN 22 (X)
21	GND	IN 23 (Y)	IN 23 (X)
22	GND	IN 24 (Y)	IN 24 (X)
23	GND	IN 25 (Y)	IN 25 (X)
24	GND	IN 26 (Y)	IN 26 (X)
25	GND	IN 27 (Y)	IN 27 (X)
26	GND	IN 28 (Y)	IN 28 (X)
27	GND	IN 29 (Y)	IN 29 (X)
28	GND	IN 30 (Y)	IN 30 (X)
29	GND	IN 31 (Y)	IN 31 (X)
30	GND	IN 32 (Y)	IN 32 (X)
31	GND	GND	GND
32	GND	GND	GND

CNS204			
NO.	A	B	C
1	GND	IN 17 (Y)	IN 17 (X)
2	GND	GND	GND
3	GND	IN 18 (Y)	IN 18 (X)
4	GND	GND	GND
5	GND	IN 19 (Y)	IN 19 (X)
6	GND	GND	GND
7	GND	IN 20 (Y)	IN 20 (X)
8	GND	GND	GND
9	GND	IN 21 (Y)	IN 21 (X)
10	GND	GND	GND
11	GND	IN 22 (Y)	IN 22 (X)
12	GND	GND	GND
13	GND	IN 23 (Y)	IN 23 (X)
14	GND	GND	GND
15	GND	IN 24 (Y)	IN 24 (X)
16	GND	GND	GND
17	GND	IN 25 (Y)	IN 25 (X)
18	GND	GND	GND
19	GND	IN 26 (Y)	IN 26 (X)
20	GND	GND	GND
21	GND	IN 27 (Y)	IN 27 (X)
22	GND	GND	GND
23	GND	IN 28 (Y)	IN 28 (X)
24	GND	GND	GND
25	GND	IN 29 (Y)	IN 29 (X)
26	GND	GND	GND
27	GND	IN 30 (Y)	IN 30 (X)
28	GND	GND	GND
29	GND	IN 31 (Y)	IN 31 (X)
30	GND	GND	GND
31	GND	IN 32 (Y)	IN 32 (X)
32	GND	GND	GND

CNS305			
NO.	A	B	C
1	BSEL3		
2	BSEL1	BSEL2	
3			
4	STLA		SUB OUT
5			
6	NC		XRD
7	INIT	RST	XWR
8	GND	DB0	DB1
9	DB2	DB3	DB4
10	DB5	DB6	DB7
11	GND	AB1	AB2
12	AB3	AB4	AB5
13	AB6	AB7	AB8
14	AB9		
15	+5V	+5V	+5V
16	GND	GND	GND

9-12

9-12

BVS-A3232

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CNS103

NO.	A	B	C
1	GND	GND	GND
2	GND	GND	GND
3	+15V	+15V	+15V
4	-15V	-15V	-15V
5			
6			
7			
8	GND	OUT 32 (Y)	OUT 32 (X)
9	GND	OUT 31 (Y)	OUT 31 (X)
10	GND	OUT 30 (Y)	OUT 30 (X)
11	GND	OUT 29 (Y)	OUT 29 (X)
12	GND	OUT 28 (Y)	OUT 28 (X)
13	GND	OUT 27 (Y)	OUT 27 (X)
14	GND	OUT 26 (Y)	OUT 26 (X)
15	GND	OUT 25 (Y)	OUT 25 (X)
16	GND	OUT 24 (Y)	OUT 24 (X)
17	GND	OUT 23 (Y)	OUT 23 (X)
18	GND	OUT 22 (Y)	OUT 22 (X)
19	GND	OUT 21 (Y)	OUT 21 (X)
20	GND	OUT 20 (Y)	OUT 20 (X)
21	GND	OUT 19 (Y)	OUT 19 (X)
22	GND	OUT 18 (Y)	OUT 18 (X)
23	GND	OUT 17 (Y)	OUT 17 (X)
24			
25			
26			
27			
28			
29	GND	IN 1 (Y)	IN 1 (X)
30	GND	IN 2 (Y)	IN 2 (X)
31	GND	IN 3 (Y)	IN 3 (X)
32	GND	GND	GND

CNS102

NO.	A	B	C
1	GND	GND	GND
2	GND	GND	GND
3	+15V	+15V	+15V
4	-15V	-15V	-15V
5		GND	B B IN
6			
7	9PIN TX+	GND	9PIN RX+
8	9PIN TX-	GND	9PIN RX-
9			
10	TXD	RXD	
11	CTS	DSR	
12			DTR
13			
14	+5V		
15			
16	1 S BUS H	GND	2 S BUS H
17	1 S BUS C	GND	2 S BUS C
18	3 S BUS H	GND	4 S BUS H
19	3 S BUS C	GND	4 S BUS C
20			
21	TALLY COM	TALLY 1	TALLY 2
22			
23			
24			
25			
26			
27			
28			
29	P DOWN 1	SENCE 1	ROTATE DET1
30	P DOWN 2	SENCE 2	ROTATE DET2
31			TH LEV
32	GND	GND	GND

CNS101

NO.	A	B	C
1	GND	GND	GND
2	GND	GND	GND
3	+15V	+15V	+15V
4	-15V	-15V	-15V
5		GND	B B IN
6			
7	9PIN TX+	GND	9PIN RX+
8	9PIN TX-	GND	9PIN RX-
9			
10	TXD	RXD	
11	CTS	DSR	
12			DTR
13			
14	+5V		
15			
16	1 S BUS H	GND	2 S BUS H
17	1 S BUS C	GND	2 S BUS C
18	3 S BUS H	GND	4 S BUS H
19	3 S BUS C	GND	4 S BUS C
20			
21	TALLY COM	TALLY 1	TALLY 2
22			
23			
24			
25			
26			
27			
28			
29	P DOWN 1	SENCE 1	ROTATE DET1
30	P DOWN 2	SENCE 2	ROTATE DET2
31			TH LEV
32	GND	GND	GND

CNS203

NO.	A	B	C
1	GND	GND	GND
2	GND	IN 4 (Y)	IN 4 (X)
3	GND	IN 5 (Y)	IN 5 (X)
4	GND	IN 6 (Y)	IN 6 (X)
5	GND	IN 7 (Y)	IN 7 (X)
6	GND	IN 8 (Y)	IN 8 (X)
7	GND	IN 9 (Y)	IN 9 (X)
8	GND	IN 10 (Y)	IN 10 (X)
9	GND	IN 11 (Y)	IN 11 (X)
10	GND	IN 12 (Y)	IN 12 (X)
11	GND	IN 13 (Y)	IN 13 (X)
12	GND	IN 14 (Y)	IN 14 (X)
13	GND	IN 15 (Y)	IN 15 (X)
14	GND	IN 16 (Y)	IN 16 (X)
15	GND	IN 17 (Y)	IN 17 (X)
16	GND	IN 18 (Y)	IN 18 (X)
17	GND	IN 19 (Y)	IN 19 (X)
18	GND	IN 20 (Y)	IN 20 (X)
19	GND	IN 21 (Y)	IN 21 (X)
20	GND	IN 22 (Y)	IN 22 (X)
21	GND	IN 23 (Y)	IN 23 (X)
22	GND	IN 24 (Y)	IN 24 (X)
23	GND	IN 25 (Y)	IN 25 (X)
24	GND	IN 26 (Y)	IN 26 (X)
25	GND	IN 27 (Y)	IN 27 (X)
26	GND	IN 28 (Y)	IN 28 (X)
27	GND	IN 29 (Y)	IN 29 (X)
28	GND	IN 30 (Y)	IN 30 (X)
29	GND	IN 31 (Y)	IN 31 (X)
30	GND	IN 32 (Y)	IN 32 (X)
31	GND	GND	GND
32	GND	GND	GND

CNS202

NO.	A	B	C
1	GND	GND	GND
2	G LED+		
3		R LED-	
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23	NC	GND	
24		AVAIL OUT	
25	AVAIL IN		NC
26	KILL SW OUT	WD 0 OUT	ACTIV OUT
27	NC	BROARD OUT	ACCESS ER OUT
28			
29	KILL SW IN	WD 0 IN	ACTIV IN
30		BROARD IN	ACCESS ER IN
31			
32	GND	GND	GND

CNS201

NO.	A	B	C
1	GND	GND	GND
2	G LED+		
3		R LED-	
4			
5			
6			
7			
8			
9			
10	GND	GND	GND
11	GND	GND	GND
12	GND	GND	GND
13	GND	GND	GND
14	GND	GND	GND
15	GND	GND	GND
16	GND	GND	GND
17	GND	GND	GND
18	GND	GND	GND
19	GND	GND	GND
20			
21			
22			
23	GND	GND	
24		AVAIL IN	
25	AVAIL OUT		NC
26	KILL SW IN	WD 0 IN	ACTIV IN
27	NC	BROARD IN	ACCESS ER IN
28			
29	KILL SW OUT	WD 0 OUT	ACTIV OUT
30	NC	BROARD OUT	ACCESS ER OUT
31			
32	GND	GND	GND

CNS303

NO.	A	B	C
1	BSEL3		
2	BSEL1	BSEL2	
3			
4	SILA	SUB OUT	
5			
6	GND		XRD
7	INIT	RST	XWR
8	GND	DB0	DB1
9	DB2	DB3	DB4
10	DB5	DB6	DB7
11	GND	AB1	AB2
12	AB3	AB4	AB5
13	AB6	AB7	AB8
14	AB9		
15	+5V	+5V	+5V
16	GND	GND	GND

CNS302

NO.	A	B	C
1	BSEL3		
2	BSEL1	BSEL2	
3			
4	SILA		
5	NTSC/PAL		
6			XRD
7		RST	XWR
8	GND	DB0	DB1
9	DB2	DB3	DB4
10	DB5	DB6	DB7
11	GND	AB1	AB2
12	AB3	AB4	AB5
13	AB6	AB7	AB8
14	AB9	AB10	AB11
15	+5V	+5V	+5V
16	GND	GND	GND

CNS301

NO.	A	B	C
1	BSEL3		
2	BSEL1	BSEL2	
3			
4	SILA		
5	NTSC/PAL		
6			XRD
7		RST	XWR
8	GND	DB0	DB1
9	DB2	DB3	DB4
10	DB5	DB6	DB7
11	GND	AB1	AB2
12	AB3	AB4	AB5
13	AB6	AB7	AB8
14	AB9	AB10	AB11
15	+5V	+5V	+5V
16	GND	GND	GND

CN1

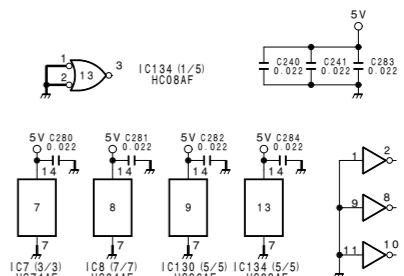
1	+5V	CN1 (1/8)
2	+5V	CN1 (2/8)
3	+5V	CN1 (3/8)
4	+5V	CN1 (4/8)
5	+15V	CN1 (5/8)
6	+15V	CN1 (6/8)
7	-15V	CN1 (7/8)
8	-15V	CN1 (8/8)

CN2

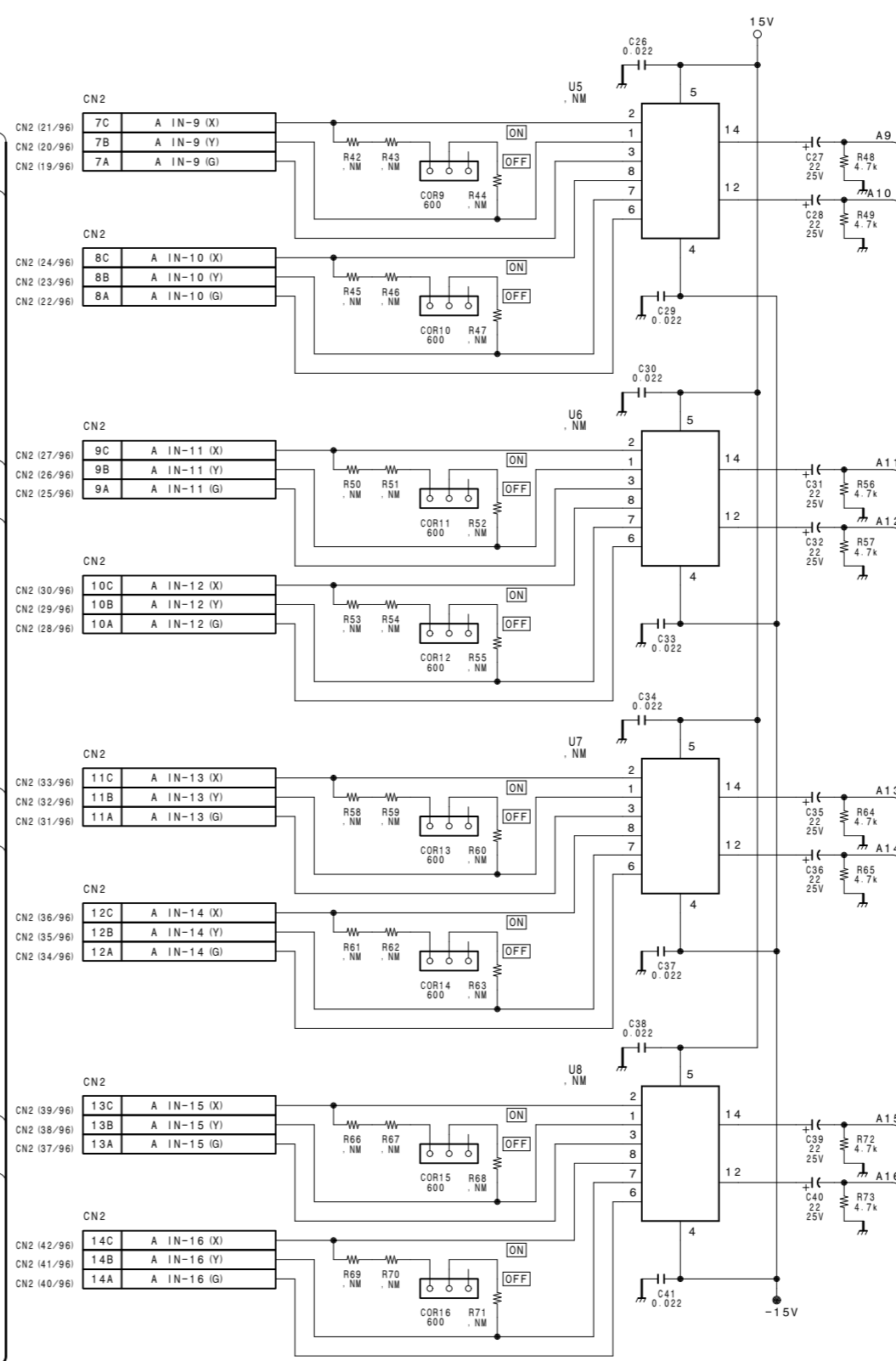
1	+5V	CN2 (1/8)
2	+5V	CN2 (2/8)
3	+5V	CN2 (3/8)
4	+5V	CN2 (4/8)
5	+15V	CN2 (5/8)
6	+15V	CN2 (6/8)
7	-15V	CN2 (7/8)
8	-15V	CN2 (8/8)

MB-721

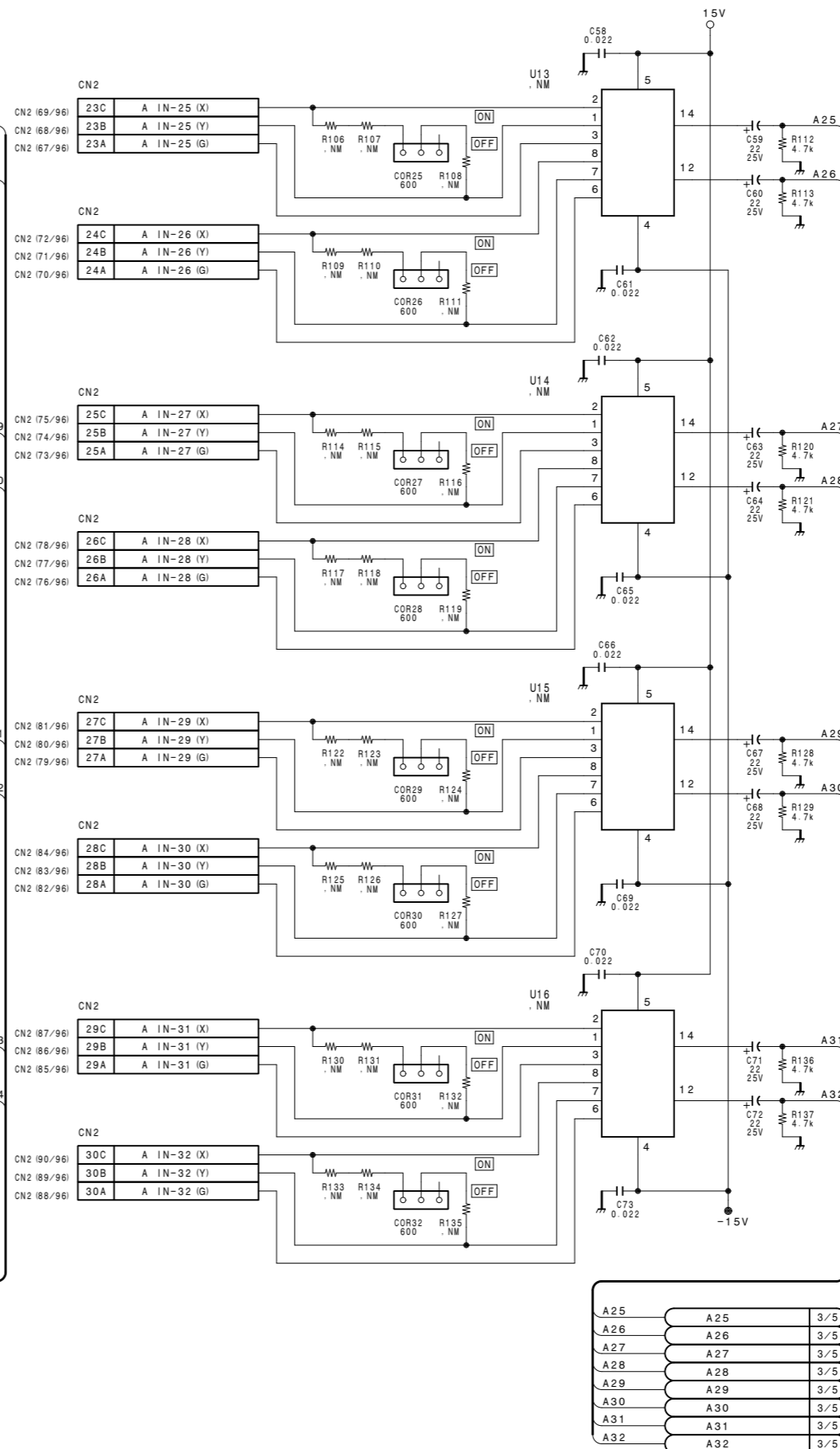
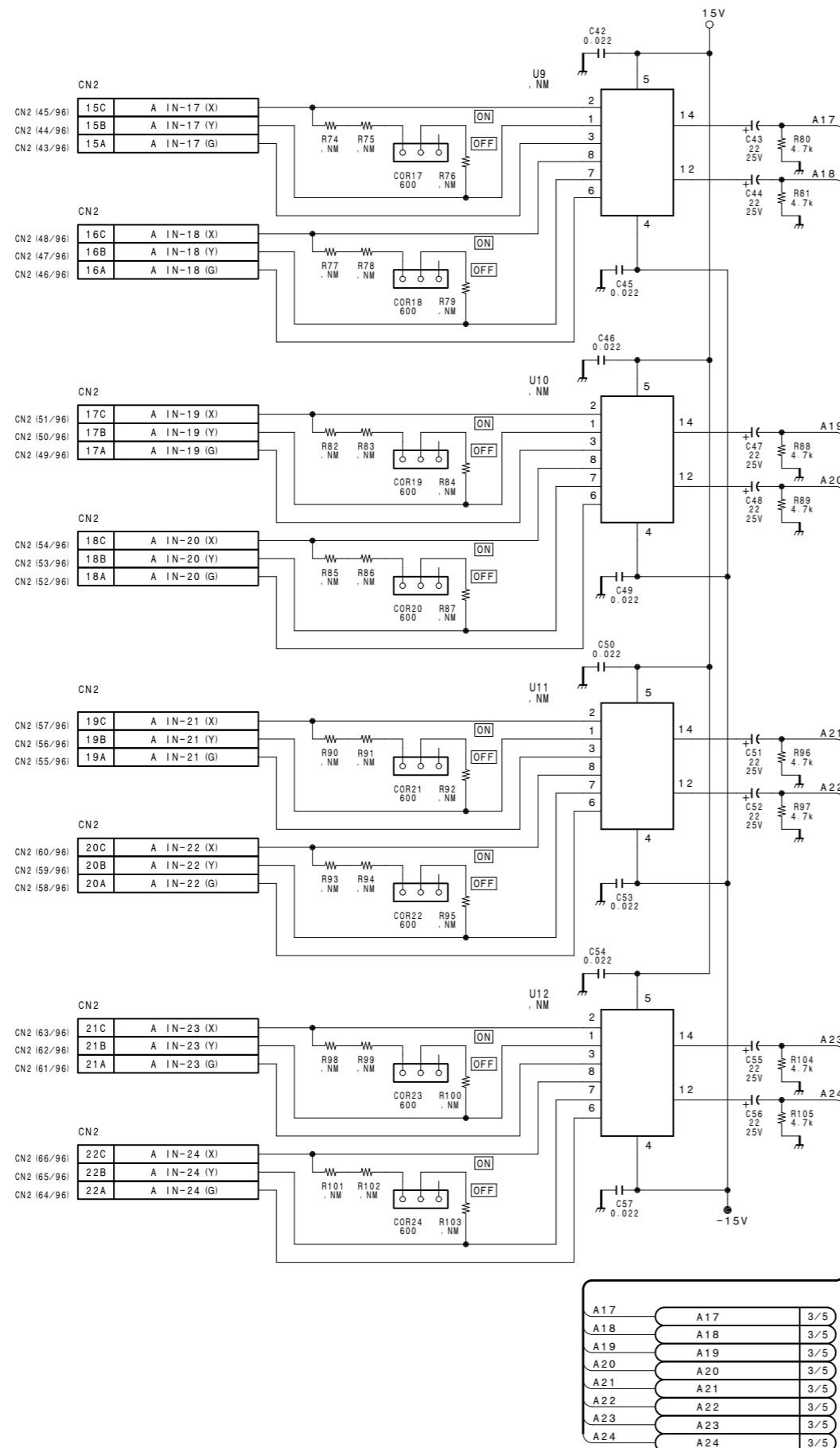
BOARD NO. 1-661-801-11
LOT NO. 603-
B-YBVS3232-MB721



LOT NO. 603-
B-¥BVS A3232-MX82



A9	A9	3/5
A10	A10	3/5
A11	A11	3/5
A12	A12	3/5
A13	A13	3/5
A14	A14	3/5
A15	A15	3/5
A16	A16	3/5



1

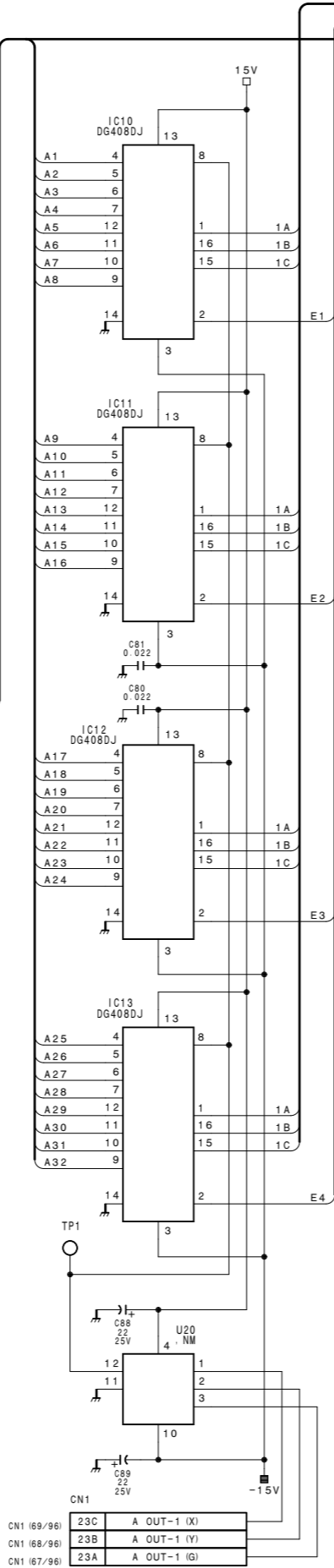
2

3

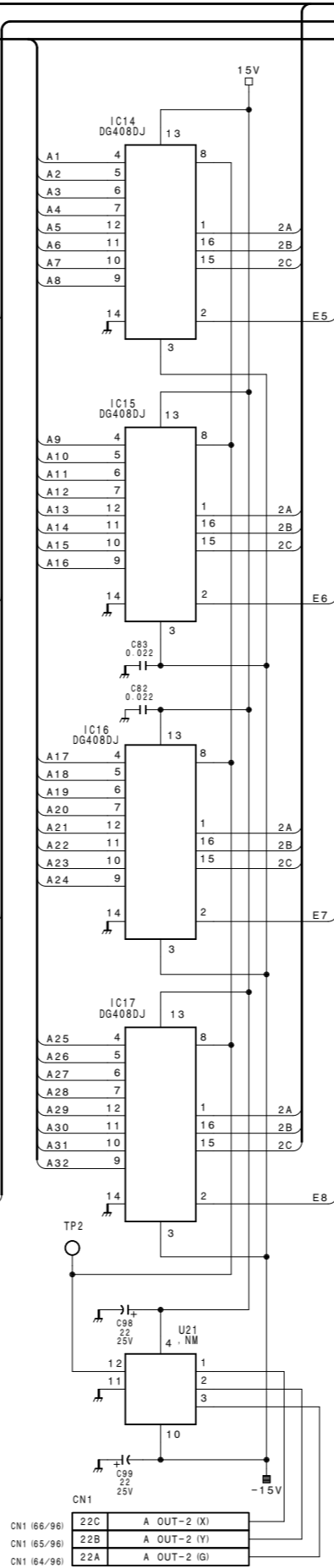
4

5

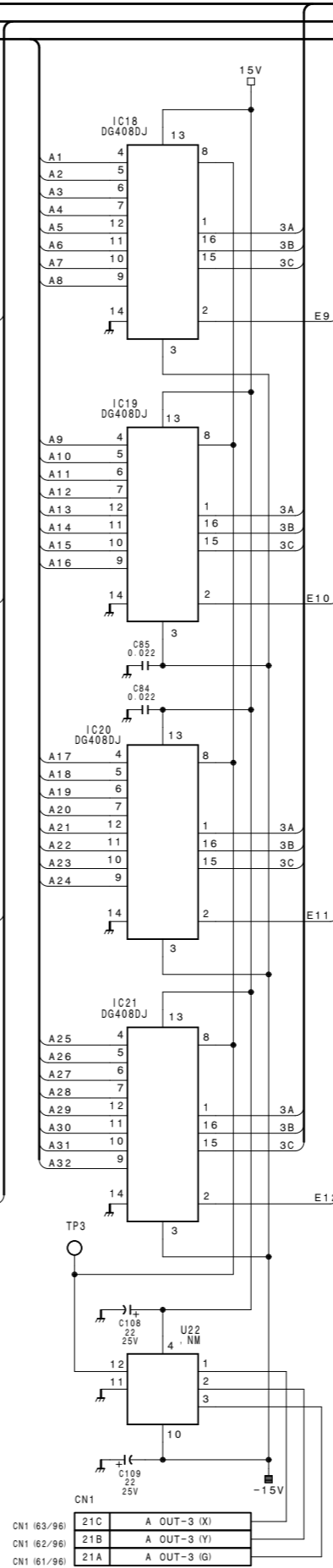
2/5	A1	A1
2/5	A2	A2
2/5	A3	A3
2/5	A4	A4
2/5	A5	A5
2/5	A6	A6
2/5	A7	A7
2/5	A8	A8
2/5	A9	A9
2/5	A10	A10
2/5	A11	A11
2/5	A12	A12
2/5	A13	A13
2/5	A14	A14
2/5	A15	A15
2/5	A16	A16
2/5	A17	A17
2/5	A18	A18
2/5	A19	A19
2/5	A20	A20
2/5	A21	A21
2/5	A22	A22
2/5	A23	A23
2/5	A24	A24
2/5	A25	A25
2/5	A26	A26
2/5	A27	A27
2/5	A28	A28
2/5	A29	A29
2/5	A30	A30
2/5	A31	A31
2/5	A32	A32



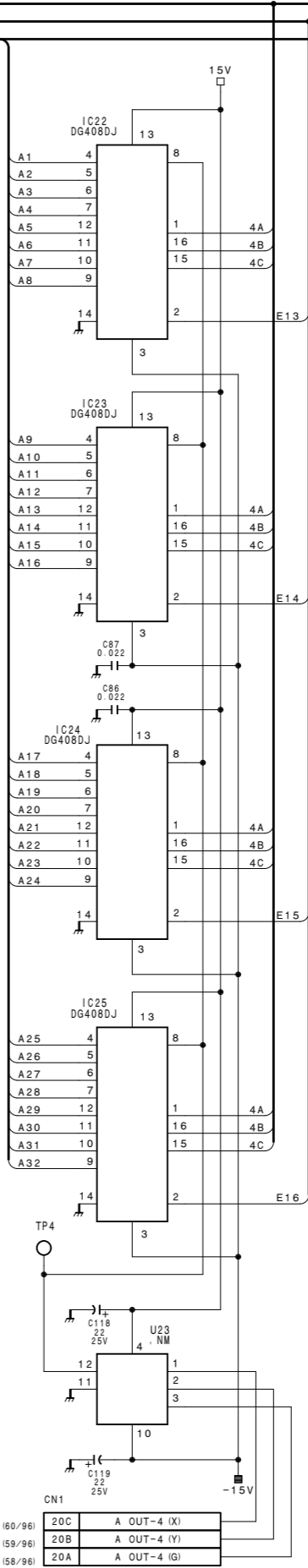
9-18



9-18



F



G

H

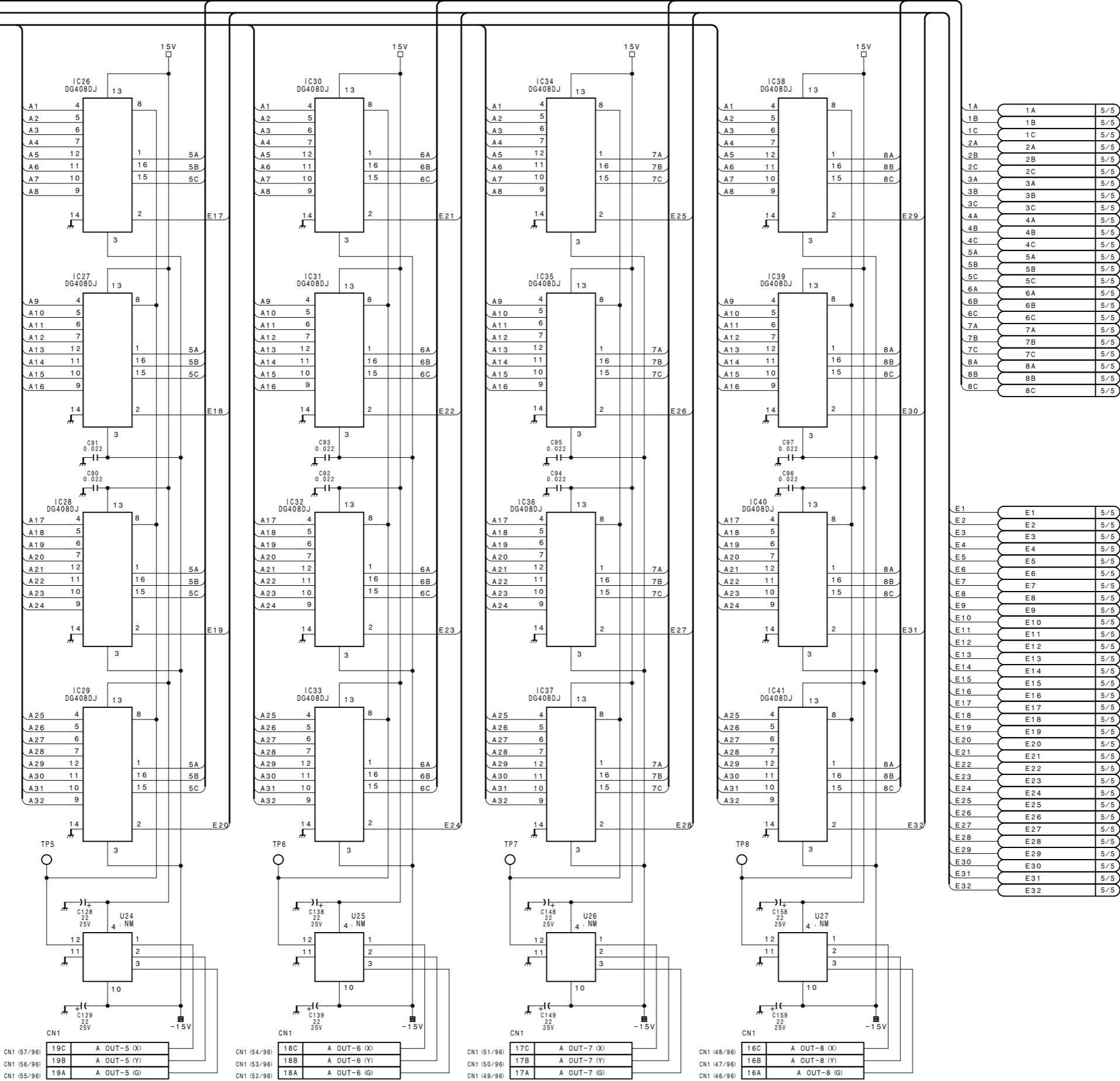
A

B

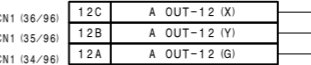
C

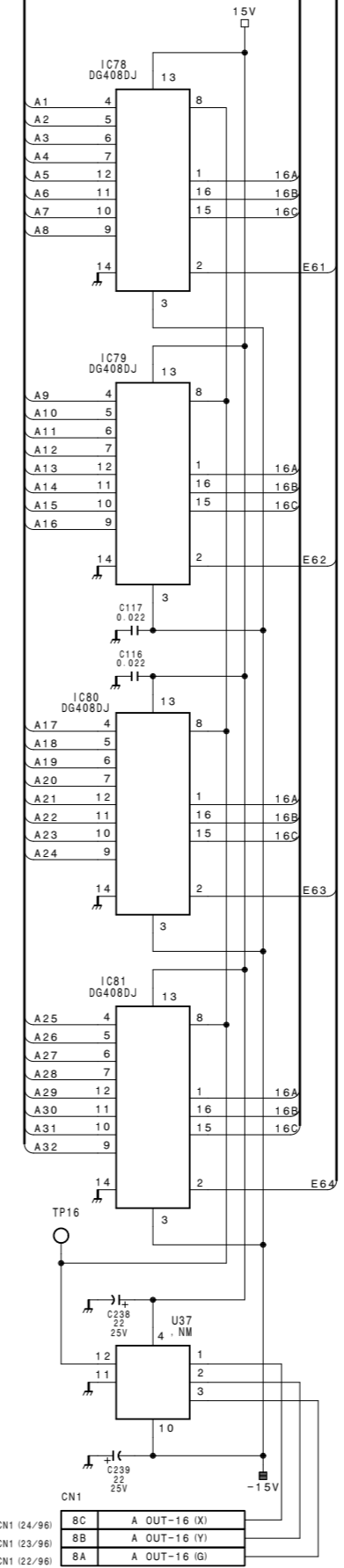
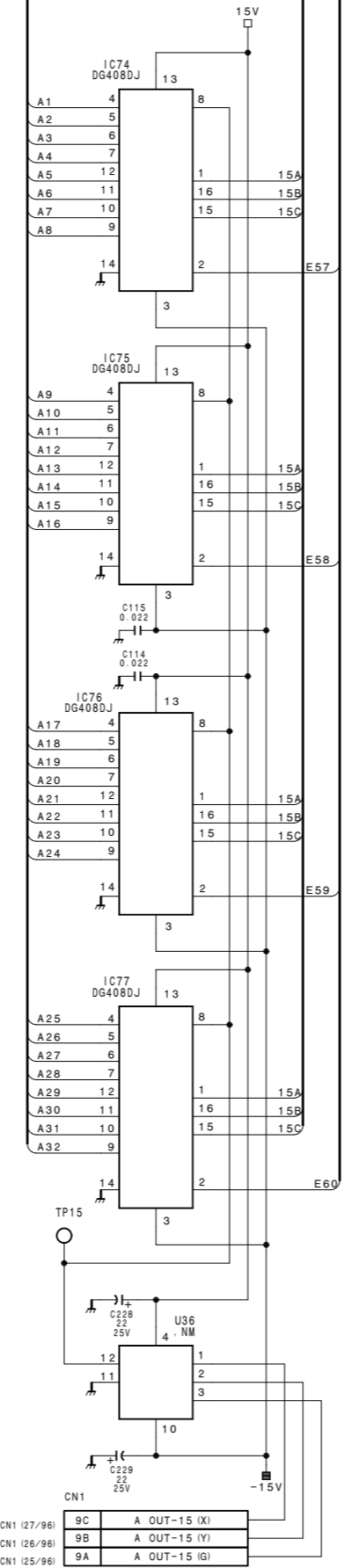
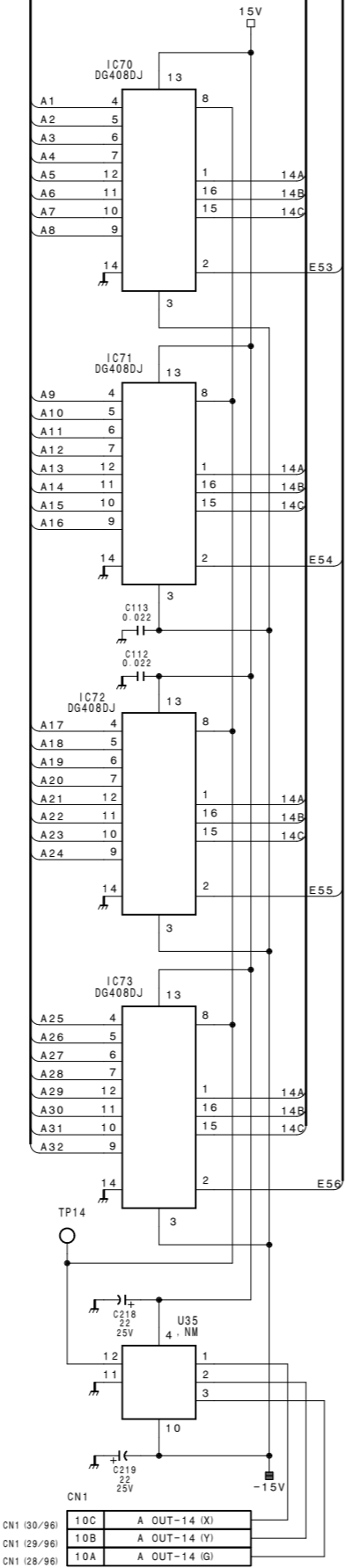
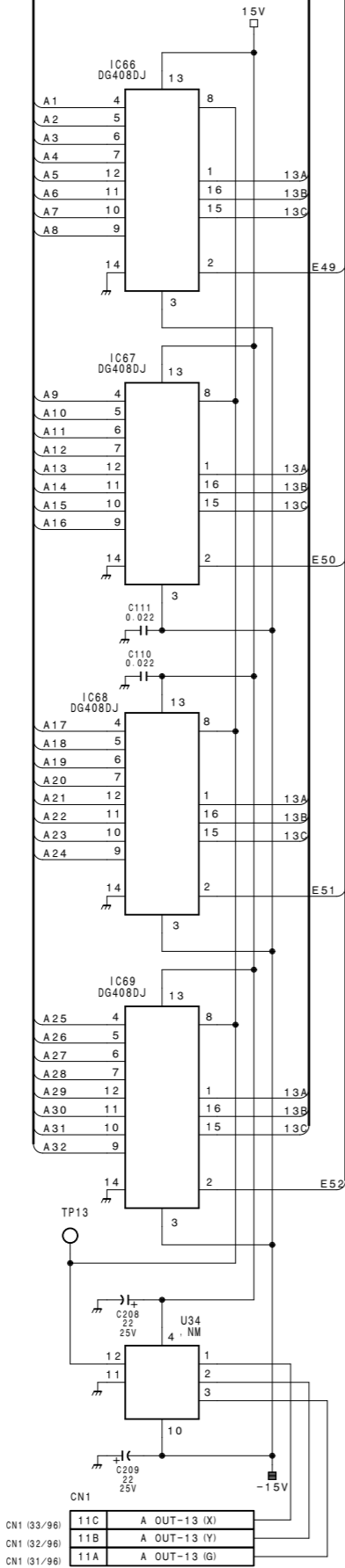
D

E



MX-82 (3/5)
BOARD NO. 1-660-074-11
LOT NO. 603-
B-WBVS3232-MX82

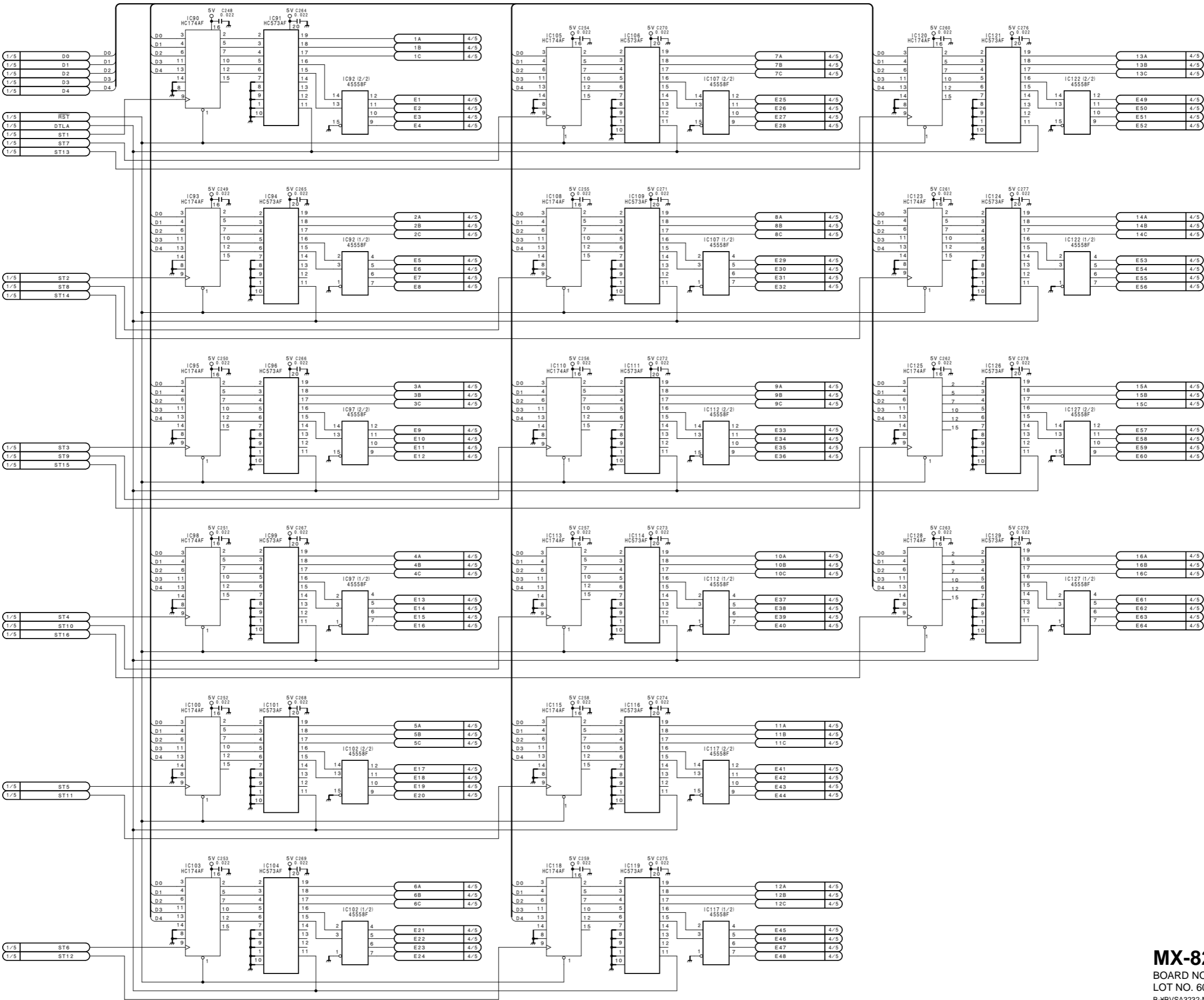




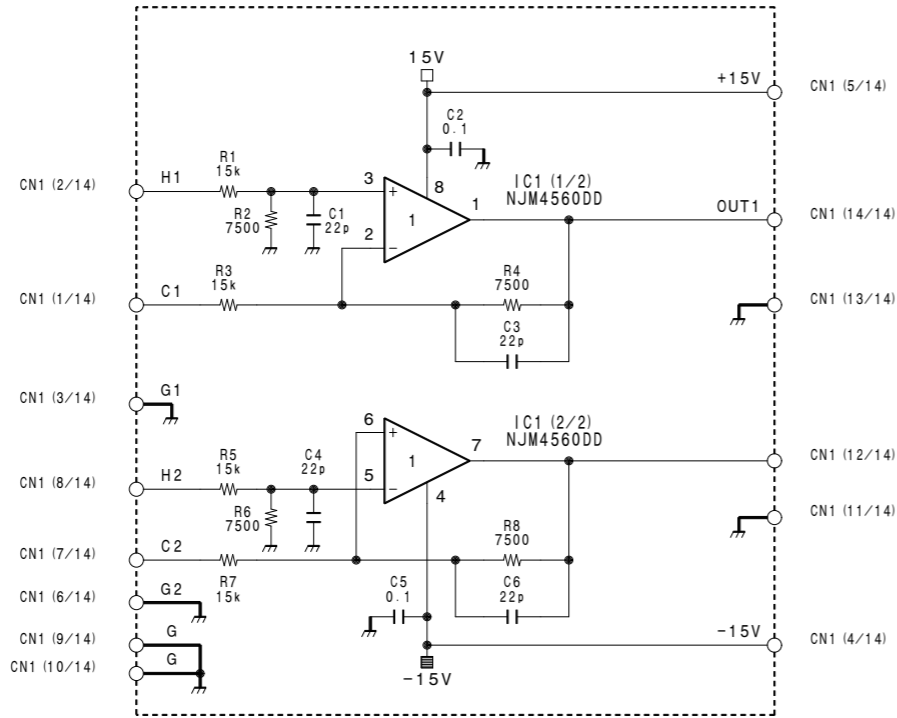
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9B	9B	5/5
9C	9C	5/5
10A	10A	5/5
10B	10B	5/5
10C	10C	5/5
11A	11A	5/5
11B	11B	5/5
11C	11C	5/5
12A	12A	5/5
12B	12B	5/5
12C	12C	5/5
13A	13A	5/5
13B	13B	5/5
13C	13C	5/5
14A	14A	5/5
14B	14B	5/5
14C	14C	5/5
15A	15A	5/5
15B	15B	5/5
15C	15C	5/5
16A	16A	5/5
16B	16B	5/5
16C	16C	5/5

E33	E33	5/5
E34	E34	5/5
E35	E35	5/5
E36	E36	5/5
E37	E37	5/5
E38	E38	5/5
E39	E39	5/5
E40	E40	5/5
E41	E41	5/5
E42	E42	5/5
E43	E43	5/5
E44	E44	5/5
E45	E45	5/5
E46	E46	5/5
E47	E47	5/5
E48	E48	5/5
E49	E49	5/5
E50	E50	5/5
E51	E51	5/5
E52	E52	5/5
E53	E53	5/5
E54	E54	5/5
E55	E55	5/5
E56	E56	5/5
E57	E57	5/5
E58	E58	5/5
E59	E59	5/5
E60	E60	5/5
E61	E61	5/5
E62	E62	5/5
E63	E63	5/5
E64	E64	5/5

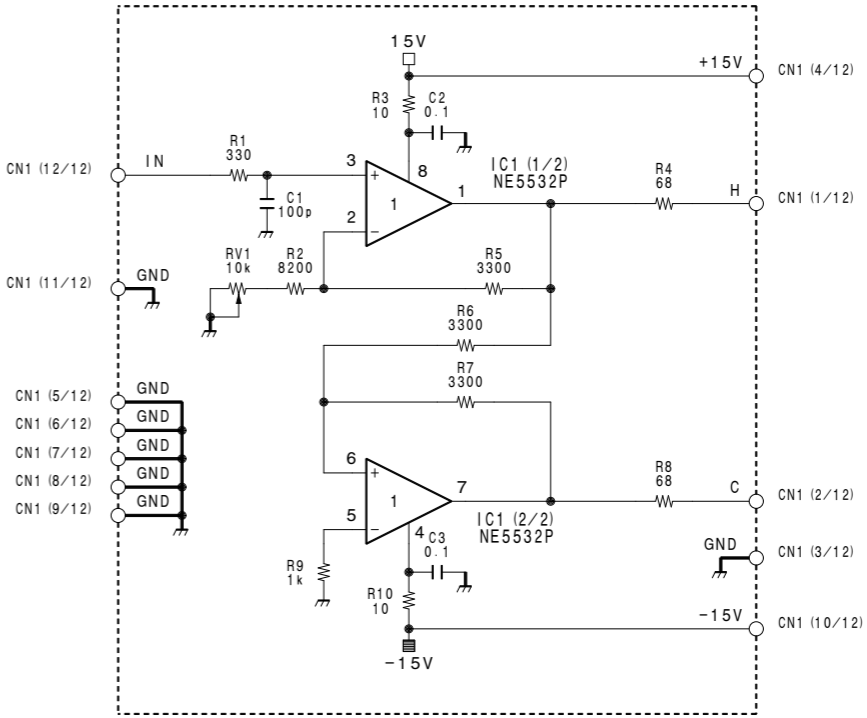
MX-82 (4/5)
BOARD NO. 1-660-074-11
LOT NO. 603-
B-VBVS A3232-MX82



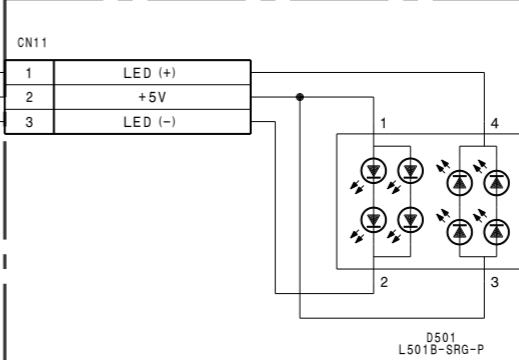
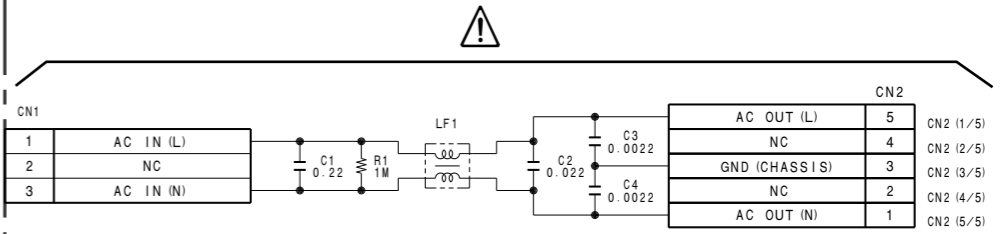
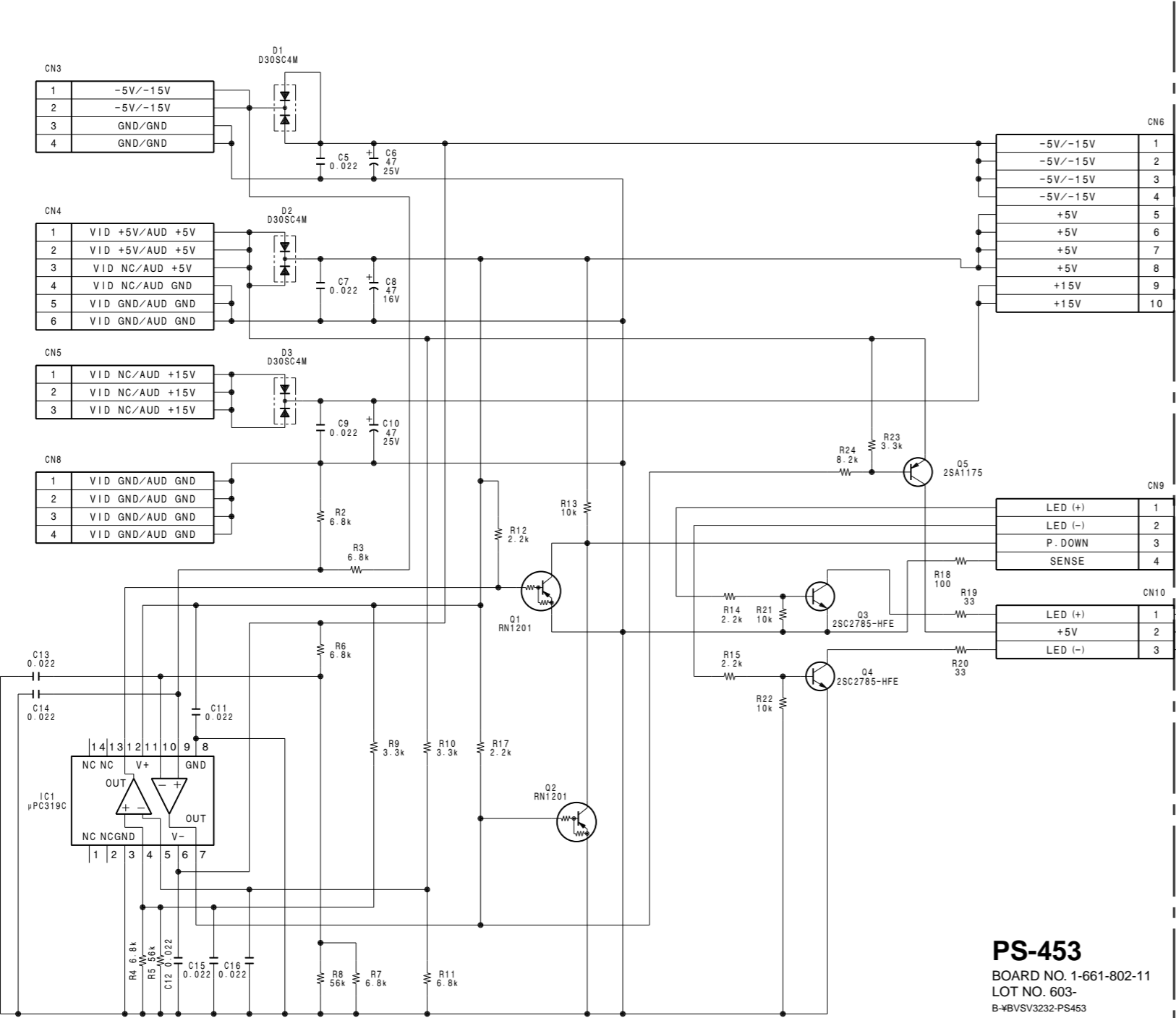
MX-82 (5/5)
BOARD NO. 1-660-074-11
LOT NO. 603-
B-VBSA3232-MX82

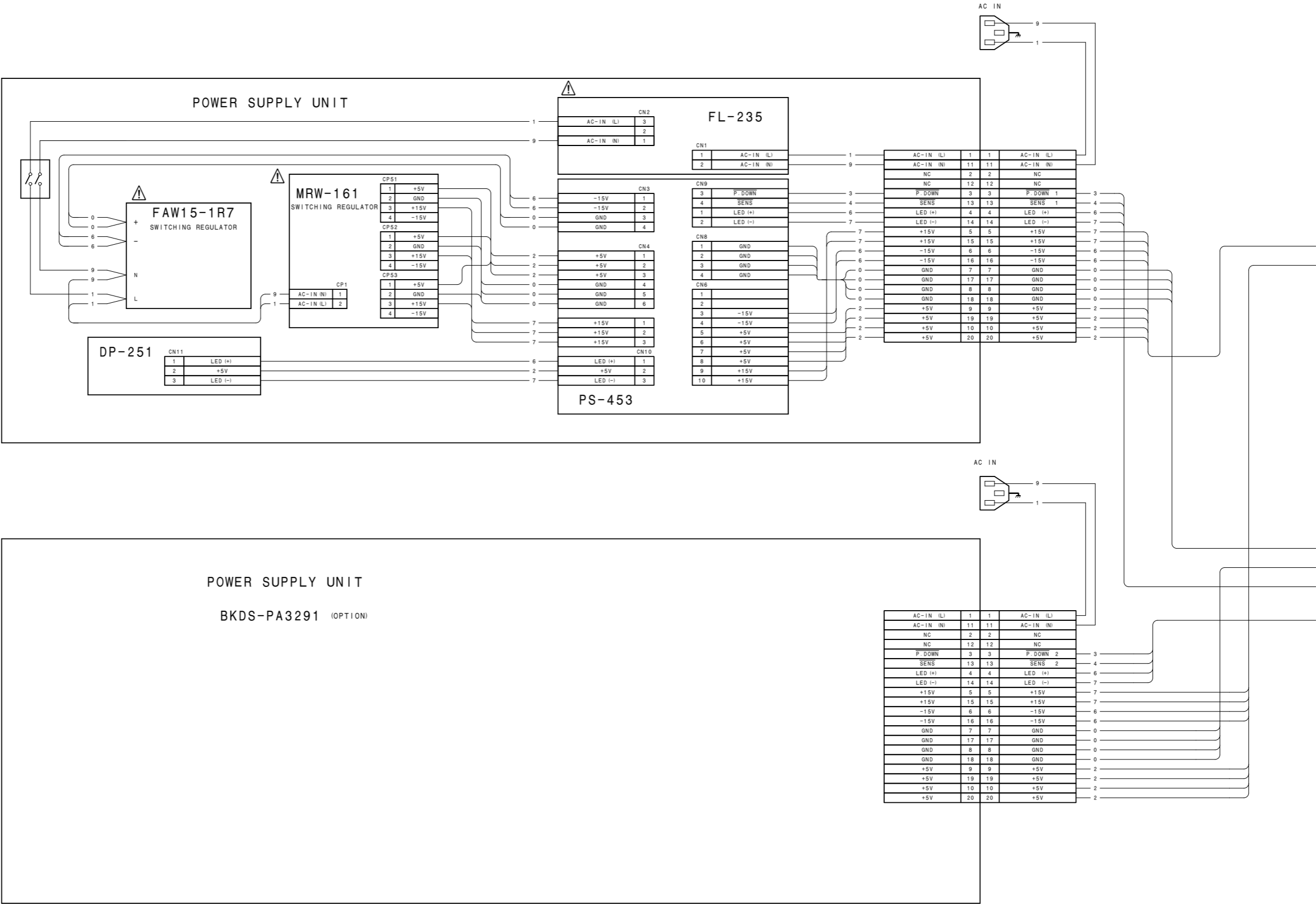


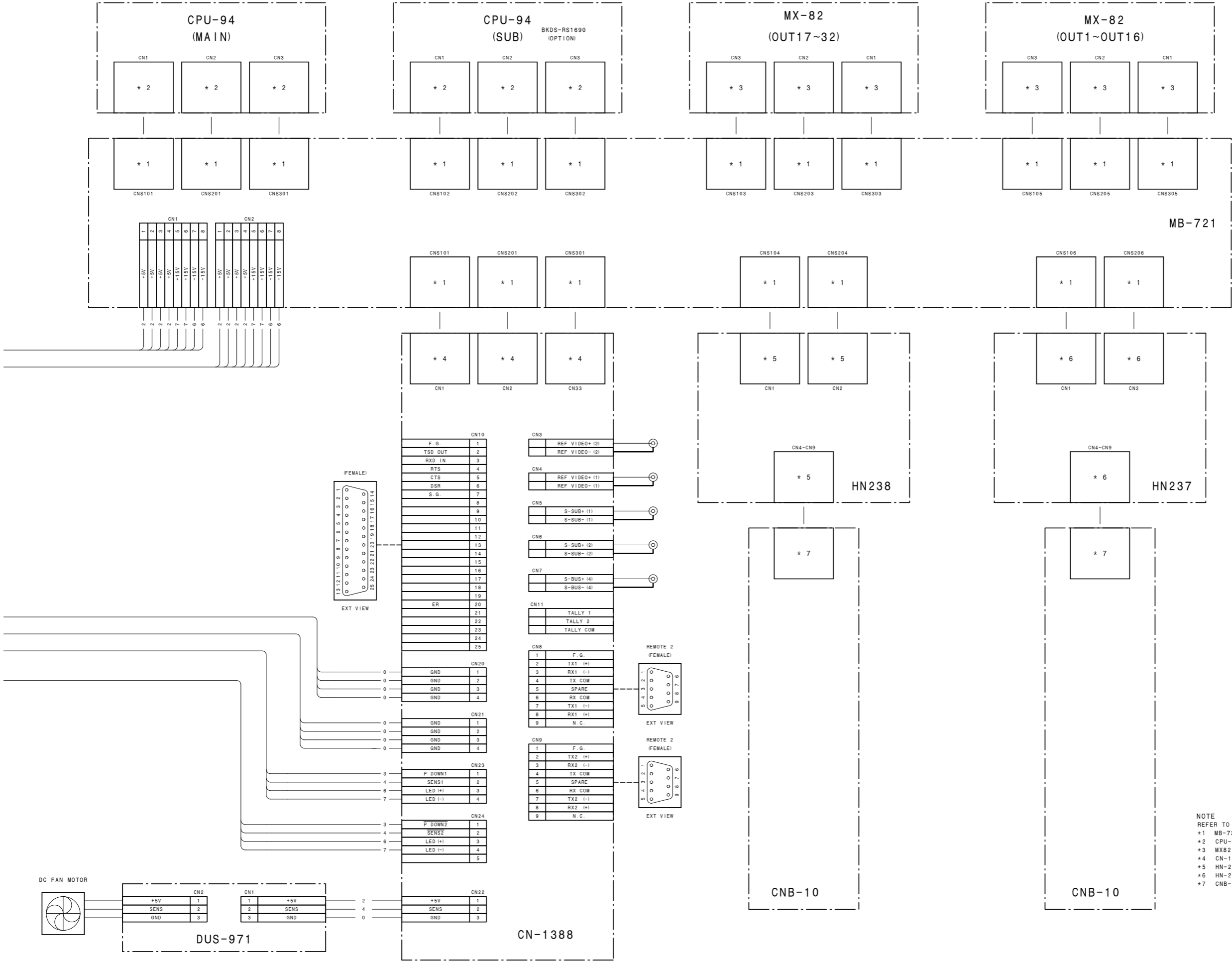
IPM-80
BOARD NO. 1-660-071-11
LOT NO. 603-
B-¥BVSA3232-IPM80



OPM-24
BOARD NO. 1-660-072-11
LOT NO. 603-
B-¥BVSA3232-OPM24







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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

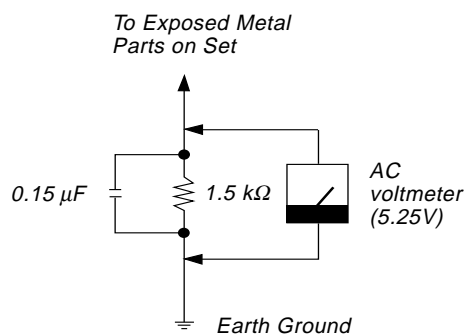


Fig A. Using an AC voltmeter to check AC leakage.



BVS-A3232 (SY)
BKDS-PA3291 (SY)
BKDS-RS1690 (W/W) J, E
3-191-296-01

Sony Corporation
Broadcast Products Company

Printed in Japan
1996. 7 16
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Published by Broadcast Products Company